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ABSTRACT

A study examined the impact on newspaper managers of three emerging technologies: videotex, personal computer networks, and pagination. The study predicted that: (1) the greater the relative advantage and compatibility of a technology, the less likely will the manager need to pursue motivational and controlling measures in getting subordinates to adopt the technology; and (2) the greater the technology's relative advantage and compatibility, the more the newspaper's content will be perceived to have improved. Results showed that: (1) the technology creates managerial, journalistic, environmental and cumulative impacts; (2) technology's varying functions correlate with varying results; (3) the technology-employee-management-environment theoretical quadrangle must be refined; (4) technology's adoption depends both on its nature and on the management's response and initiative; (5) the concept of motivation must be researched further; (6) relative advantage and compatibility, when combined, seem to act as a type of regulatory mechanism in the area of control, whether it be operational or editorial; (7) technology changes the nature of work for the manager, and the editor's approach in dealing with certain issues, but does not always change organizational priorities; (8) technology forces editors to become more adept at motivational strategies, and to become better intermediate-range planners; (9) technology has no adverse effect on editor-reporter or editor-copy editor relations, gives greater control over some aspects of the product, and makes the editor a better recruiter; (10) managers need to become more flexible; and (11) managers viewed the technology as a technical rather than a sociological concern. Studies like these at the intersection of journalism and newspaper management are on the cutting edge of journalism education. (Extensive figures and 186 endnotes are included; an appendix containing organizational questions and strategies is included.) (PRA)

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Editors and Hardware:

Three Case Studies in Technology and Newspaper Management

George Sylvie &
Wayne Danielson
The University of Texas at Austin

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Presented to the Gannett Foundation
of Rochester, New York

May 1989

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In a report of this length and complexity, errors of fact or interpretation may have crept in. The authors hope that such errors are few, but they acknowledge their sole responsibility for any that may remain.

George Sylvie
Wayne Danielson
Austin, Texas
May, 1989

EXECUTIVE SUMMARY

The newspaper industry traditionally has placed more emphasis on the economic impact of new technology and less emphasis on the social impact of the technology on the newspaper organization itself. This study, in contrast, devotes special attention to the impact on newspaper newsroom managers of three emerging technologies: videotex, personal computers and pagination.

Three Texas newspapers (*The Fort Worth Star Telegram, The Beaumont Enterprise* and *The Amarillo Globe-News*) participated in the study during the summer of 1987.

The study uses the concepts of relative advantage (the degree to which an innovation is perceived as being better than the idea it supersedes) and compatibility (the degree to which an innovation is perceived as being consistent with the existing values, past experiences and needs of potential adopters). The study predicts:

(1) the greater the relative advantage and compatibility of the technology, the less the need will be for the newsroom manager to pursue motivational and controlling measures in getting subordinates to adopt the technology; and

(2) the greater the technology's relative advantage and compatibility, the more the newspaper's content will be perceived to have improved.

Results indicate that technological compatibility appears to be a more pertinent variable than does relative advantage in predicting the need for additional staff motivation. In contrast, relative advantage appears to be a more pertinent predictor of the perceptions concerning the news product.

Compatibility and relative advantage together appear to suitably predict the need (or absence of need) for staff control; in fact, the two variables apparently serve as an "invisible editor" in terms of technology and editorial control.

In general, results show that management and user-technology interaction play a large part in the technology's adoption, but exceptions occur. The exceptions generally arise from such factors as the nature of the technology itself and the degree of management's involvement.

The "nature of the technology" can be "internal" (the technology has certain inherent attributes that affect its rate of diffusion) or "external" (the technology may have certain advantages or disadvantages when it functions as a tool to accomplish a specific task in the newsroom environment).

For example, it appears that pagination may be one of the newspaper industry's more difficult and volatile technologies; i.e., it necessitates more intermediate management and planning, and it can cause more managerial problems than the other two technologies

In contrast personal computers seem to warrant little, if any, managerial attention in a situation where appropriate planning and testing have been attempted with some degree of success.

Videotex lies in the middle and is somewhat more difficult to analyze from the standpoint of impact. Unlike personal computers and pagination, videotex is not a management tool. It does not transform "input" into "output" as other technologies do. Rather, it is the output, and its ultimate success or failure depends on whether users like that output as much as they like the traditional newspaper.

The "involvement of management" refers to the concept of "the degree to which management uses its authority and influence to speed and facilitate the adoption of the technology."

The researchers find that technology creates a variety of impacts: managerial, journalistic, environmental and cumulative. Each impact differs according to the circumstances -- specifically, the type of technology, the reaction and resources of the newspaper, the nature of the journalistic task involved and, probably most important, the functions and capabilities of the technology.

The researchers also find several implications for the newspaper industry's approach toward technology:

- *The technology in each case changes the nature of work for the manager.*

In addition to facilitating the editor's tasks, the technology adds work, gives more time for other duties, necessitates new tasks, requires new abilities, changes the editor's managerial priorities and creates new responsibilities.

- *The technology also changes the editor's approach to dealing with certain issues, especially those related to the technologies.*

While some editors rely on technological "gurus" or engineers to solve their technological woes, most attempt to increase their own technological know-how so as to become better managers.

- *The technology does not always change organizational priorities.*

Although some re-organization of personnel is almost always necessary to accommodate the technology, organizational priorities often remain unaffected.

- *Some editors -- faced with what they view as technological "shortcomings," inadequacies or realities -- must become more adept at motivational strategies than they were prior to the technology.*

Their new duties often involve allaying staff fears about the unknown or assuring staffers that inadequacies are being addressed.

- *The technology forces -- or, at least, prompts -- editors to become better intermediate-range planners.*

Limitations of the new technology warrant forethought in such areas as story and fiscal budgeting, editorial decision-making, staffing and personnel evaluation.

- *The technology gives greater control over some aspects of the product than it gives over others.*

For example, pagination enhances control over page design and layout, but indirectly appears to decrease control over textual content.

- *The technology nearly always makes the editor a better recruiter.*

Modern technology has a built-in appeal to recruits.

- *Managers have to learn to become more flexible, because of the additional work that the technology creates.*

Many managers report that they have to do more work, thanks to the technology, but that they now seem to have the time to do it.

The researchers sensed that most managers continue to view new technology mainly as a technical or economic concern and generally ignore or underestimate its organizational ramifications. Consequently, the researchers recommend that :

- *Newspapers attempt to increase editors' capacities to deal with technical and technically-related organizational problems.*
- *Newspapers study potential technology purchases not only in economic terms, but also in terms of the technology's compatibility with the existing corporate culture.*
- *Newspapers attempt further standardization of management of newspaper technology.*
- *Newspapers intentionally and consciously evaluate the introduction and impact of new technologies.*
- *Newspapers re-evaluate the job of editor/manager and develop a comprehensive model of management functions, priorities, roles and responsibilities.*

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CHAPTER ONE

INTRODUCTION

Research Problem

In the late 1950s, when Leavitt and Whisler[1] predicted the impact of information technology 30 years hence, they foresaw "revolutionary effects" on management, especially middle managers. They concluded that middle management would divide, with most managers "shrinking and sinking" into a more highly routinized state while the remainder would "proliferate and rise" as more creativity was demanded of them.[2]

Some 30 years later, emerging technologies still offer opportunities and problems for industry, especially newspapers. The newspaper industry places much technological emphasis on the equipment -- often called "hardware" -- and on technology's adaptation to the individual newspaper.[3] This implies a preference for technological capabilities (usually in enhanced or increased production) rather than in technological impact within the organization.[4]

The industry has addressed part of this impact: Video display terminals' effects on employee safety have received close scrutiny.[5] But managing the technology -- especially its accompanying organizational repercussions -- may become more difficult as technology advances and may hamper efforts at strategic responses to employee-technology interaction.[6]

For example, current industry practitioners regard video display terminals as an integral part of the newsroom. But VDTs have generated widespread concern about radiation hazards.[7] Although publishers have sought to address the issue case by case, the Newspaper Guild has sought to have various VDT health measures legislated or put in its collective bargaining contracts.[8] The two parties seem at odds over the use of a basic technology.

Contemporary management generally does not acknowledge the legitimacy of differing viewpoints as the newspaper seeks to adopt the new technology, and views resistance as uninformed, delinquent or symptomatic of dubious political motivations. One study found that such attitudes result in largely ad hoc technology implementation.[9] Such attitudes also may cause employee morale and motivation problems.[10]

Many newspaper managerial implications follow. For instance, if organization theory correctly views organizations as social rather than as rational systems, then newspapers must ask how to consider the technology's social effects early enough so that potential problems can be anticipated.[11]

Also, appropriate technology management is essential if the newspapers want to avoid internal technological myopia, occurring when management lacks the strategic vision necessary for successful application of the technology.[12] Although one study found newspaper managers confident that they had taught newsroom employees about the overall VDT system operation, the managers were not as aware of problems in making deadlines, technical system problems and changes in job skills accompanying the technology.[13] In the case of videotex -- with its numerous newspaper "victims" that have unsuccessfully attempted to enter the industry -- some might say that the technology creates such "myopia" in the newspaper industry that it may be asking itself how to profitably run an "electronic newspaper."

"Myopic" is how subsequent researchers[14] might well have described the Leavitt-Whisler hypotheses. With the benefit of nearly 15 years of hindsight, Hunt and Newell found no support for some Leavitt-Whisler predictions and concluded that the early predictions generally overestimated the probable impact by the 1980s and that some predictions probably would never come to pass. They argued for more multi-firm studies of the impact of computers and more careful definitions of terms, especially "middle management."[15] The current study hopes to address those issues as they affect daily newspapers.

Purpose

This study examines the impact on managers of three emerging technologies: videotex, personal computer networks and pagination. Each technology is relatively pervasive among newspapers and carries expectations and problems. For example, pagination has automated page production in the newsroom and saved production time. But the installation, training process and union problems have proved less than desirable for some.[16]

Similarly, personal computers have helped control professional and clerical work costs while substantially increasing productivity. But linking personal computers demands adequate planning regarding software and speed requirements.[17] Meanwhile, newspaper-run videotex success stories have been few. Videotex boosters lower their market sights because users are relatively few. Unpredictable operational costs and lack of advertising remain problems for the "electronic newspaper" although the growing personal computer market and the development of a more functional product offer hope.[18]

This study will examine each technology at its host newspaper to determine several impact types: how management and employees adapted to the technology; how the newspaper environment affected the adoption of the technology; and how the varying technologies affect the nature of work at the corresponding newspapers. What are the behavioral and organizational changes?

This study, then, becomes an exercise in determining the degree of impact. But this analysis additionally focuses on the management process and technology attributes.

As previously mentioned, many newspapers mainly buy new technology to enhance production. Cost savings or profits, however, usually motivate this decision. Rogers' technology attributes of relative advantage and compatibility most closely resemble this motivation.

Rogers[19] defined relative advantage as the degree to which a technology is perceived as being better than the idea it supersedes. He defined compatibility as the degree to which an innovation is perceived as consistent with the technology adopters' existing values, past experiences and needs. Both attributes are economical, i.e., deriving their existence via comparisons. In that respect, most newspaper publishers are likely to consider these attributes in making technology purchases.

Under the above assumption, then, editors most likely will attempt to implement a certain technology with these two questions uppermost in mind: Is the technology better than its predecessor? How well does the technology comform to the newspaper staff's values, needs and expectations? This study's concern with post-adoption technological impact on management, however, eliminates the study of certain managerial functions. For example, planning, staffing and organizing usually are pre-adoption concerns of the manager; i.e., the manager ideally attempts to use these abilities to anticipate change, such as the adoption of a new technology. That leaves controlling and evaluating the technology and its use and motivating employees to use and adopt the technology as post-adoption managerial concerns. *Therefore, this study will attempt to show that the greater the relative advantage and compatibility of a technology, the less likely will the manager need to pursue motivational and controlling measures in getting subordinates to adopt the technology.*

Similarly, this suggests that greater relative advantage and compatibility of a technology facilitates journalists' work. If a copy editor has a more efficient page layout terminal or if a reporter has a more complete and flexible word processor, both will be able to do a better job and enhance the newspaper's content in the sense that the journalists perceive it as such. So this study will attempt to show that *the greater the technology's relative advantage and compatibility, the more the newspaper's content will be perceived to have improved; in other words, journalists will believe that the newspaper's quality will be enhanced.*

Technology's impact on an organization cannot be fully understood without understanding the technology's functions and values within the organization.[20] This study will more fully explore the impact of technology on newspapers and on their management.

CHAPTER TWO

THEORY AND BACKGROUND

Technology Impacts on Newspapers

Application of the various theoretical findings to the newspaper industry has been limited, at best. In fact, Williams and Rice[1] lamented the non-existence of adequate theoretical conceptualizations of the link between the implementation of new office technologies and the quality of managerial behavior with them. Much of the newspaper technology literature comes from industry trade publications and is anecdotal -- a somewhat expected result, given the evolutionary nature of technologies.

Carter,[2] however, studied the relative impact of the computer in newspaper organizations and found that although the results depended on the specific tasks for which the technology was used, organization size affected the technology-structure relationship. As newspaper size increased, computer use in newsroom tasks predicted a centralization of personnel decisions and a decentralization of news decisions. For all sized newspapers, at higher levels of computer use the addition of new copy editors was more pronounced and the number of jobs with new job descriptions increased.

In an early 1980 analysis, Compaine[3] said technology has resulted in potential worker isolation, change anxiety, new skill requirements, new organization forms, and problems of supervisor adaptability and employee motivation. Overall, the technological trend has placed production processes in editors' hands, giving the newsroom greater control over the process and making editors seemingly unanimous in perceiving flexibility as the single greatest advantage of new technological systems.[4]

As far as technological diffusion goes, Shipman's extensive literature review[5] implied that a participative style of management correlates with job satisfaction and that the relationship between job satisfaction and computerization of newsrooms is a function of the method of introduction, the types of positions using the equipment, individual characteristics of the users and the environment into which the computers are introduced. Shipman recommended using job satisfaction measurement instruments prior to implementing change and encouraged employee participation in the developmental planning stages.[6]

Smith and Fowler[7] supported that advice, finding that newsroom employees felt that management did not do a good job of collecting staff ideas about VDTs before deciding to adopt. During the transition, management confidently expected that the newspaper would adapt to the new system easily; those on the lower end of the news staff were not so confident. After VDT adoption, management was not as aware as the news staff of changes in job skills. The authors concluded that news position obviously influenced the individual's reaction to a new system in the newsroom.[8]

The trade literature, as mentioned earlier, consists largely of self-reported anecdotes at various newspapers that have adopted some technology. Still, some patterns emerged.

As Buchanan and Boddy[9] observed, publishers and editors seemed to have had strategic considerations in mind when introducing the various tools into their newsrooms. One of the most often-cited benefits of personal computers seems to be their relatively low cost[10] and efficiency.[11] For example, personal computers enhance present publishing systems that do only one thing: make the newspaper. A personal computer can perform many tasks: budgeting, word processing, graphics, serving as backup systems, performing various database operations.[12]

The most commonly mentioned advantage of pagination -- electronic makeup of pages -- is the increased control offered editors. But although pagination gives editors more control over news copy, editors still must deal with daily space shortages and typographical errors.[13] Some researchers, however, noted other, more subtle pagination effects.

Garneau's survey[14] and one other found some restaffing and reorganizing of the newspapers had been necessary and that pagination mandated a slow and difficult learning process, although some newspaper executives say they have not needed such changes.[15] Other editors claimed the technology necessitated "fully involved" planning and preparation. Installation and training "can drag on for years and years," resulting in inefficiency and demoralization should proper planning be neglected, editors said.[16]

Another editor cautioned newspapers to avoid systems that automate the composing room process of pasteup and, instead, to embrace those that automate the newsroom process. Systems that try to automate pasteup raise the question of who sits at the terminal:[17]

> If a typographer, it means additional political problems for an editor trying to get newsroom control over the process. If a journalist, it means getting control at the price of assigning journalists to do what is essentially typographer's work.

As more vendors enter the marketplace and install more systems at better prices, many industry experts believe pagination will live up to its promise.[18] But experts have recommended that newspapers appoint a pagination "guru" to coordinate the transition and to help avoid implementing a system managed by production personnel unfamiliar with the daily struggles of desk editors. Similarly, this person also would help temper the opinions of unsympathetic editors who expect miracles from technicians.[19]

In contrast to the sparse pagination and personal computer research, the videotex literature is relatively extensive. For the most part, videotex is still largely in the trial phase in the U.S. newspaper industry. The trade press has spent much time trying to determine if there is a viable market. For example, although one editor said that the technology is worth having, he could not say at what cost. Videotex's success, he added, depended on its ultimate costs and whether it could ever offer "the kind of intimacy necessary for comfortable reading."[20]

This speculation inherently fostered a retrenchment of sorts among newspaper traditionalists. They argued that although the "electronic newspaper" (videotex's initial label) and electronics in general would change the industry, the future remained with newspapers stressing quality content, "for here teletext and videotex cannot tread."[21] A leading industry analyst cautioned editors not to confuse efficiency of transferring information with efficiency in perceiving it. Those successful electronic era newspapers, he predicted, would stand out via an editorial quality making them "necessary to the lives of their readers."[22]

Still, several newspapers -- most of them dailies -- started videtoex services in the early 1980s, when much was unknown about the medium's market. But by mid-decade, two researchers claimed the technology had not reached its potential primarily because of excessive consumer costs and still-developing transmission methods.[23] The authors predicted, however, that newspapers would be subject to the greatest change, especially in terms of advertising, news content and subscriber reading options. They also envisioned a new, "soft" daily newspaper containing more feature stories and less hard news in response to videotex.[24]

One of the bolder earlier videotex predictions concerned Joseph's contention that newspapers must change and adapt and be prepared to move in several directions simultaneously: "The real problem for the newspaper publishing industry is to move away from single-minded and single-track futures."[25] Or as one videotex pioneer recently confirmed, most videotex experts and publishers discover that the data that consumers will retrieve often differ from what they want from the newspaper: "Print and broadcast journalists learn that videotex is not newspaper or broadcasting. The old models and mindsets are as much a hindrance as a help."[26]

For example, after a trial run with one of the earlier videotex systems, one journalist discovered that the system could not cover the wide range of interests reported in the newspaper. "The job is to use your editorial instincts and training to uncover applications that have stronger reader appeal and can be treated uniquely" in videotex, he said, concluding that prolific writing poorly substituted for logic in giving the user what the user wants to see. A genuine interest in computers and sense of graphics also are important.[27]

But research on videotex's impact on working journalists has attracted few researchers. Two anecdotal accounts[28] presented conflicting evidence: The first reported survey results revealing frustrated and disappointed videotex journalists while the second asserted that journalists can be happy in videotex if their goals complement those of their potential employer and if they have flexible skills.

Weaver conducted the most comprehensive study to date, comparing videotex systems with current journalistic practice and finding the former in "technological limbo" -- striving to carve a niche in the existing economic order.[29] Specifically, he found that writing concisely and designing pages on VDTS -- rather than reporting and information gathering -- are the primary skills required of the videotex journalists, who generally viewed the system as either benefitting journalists, readers and advertisers or having little effect on those groups. Videotex systems also tended to see news as "event-oriented," unlikely to probe complex issues and to report what happened rather than what was said.[30]

Weaver recommended hiring experienced editors and reporters, as well as those relatively inexperienced, as videotex journalists because the quality of the videotex system's content will help determine subscriber levels.[31] Interestingly, earlier advice given to newspaper editors advocated hiring non-newspaper people because they bring more of "an entrepreneurial spirit."[32] This type of contradiction is common in the literature, which often deals with the industry's seeming inability to turn the technology into a profit-making venture while simultaneously touting another newspaper's competence in managing the technology.[33]

This paradoxical nature also characterized most scholarly literature on the subject. For example, in one of the earliest works, Koehler[34] wrestled with this question and concluded that unrealistic expectations of "facsimile newspapers" produced disappointing results while the belief that newspapers would be made extinct produced formidable industry opposition. The war-era preoccupation with the development of television also was a factor.[35]

In a more recent analysis, Carey[36] criticized newspapers as in too much of a hurry to examine their own histories in order to better understand the information-consumer relationship. He argued that newspaper consumption is a habit, which, when parallelled to videotex applications, suggests that videotex in this century will more likely become a service for businesses and a small, elite consumer group, not a mass audience.[37]

Compaine,[38] somewhat more optimistic, said videotex systems must first become available to a mass audience, at an affordable price, in a usable format with a unique reason for being. He also credited the print industry with a certain "robustness" that earlier analysts have underestimated. But he predicted a piecemeal pace for change caused by innovators who will take financial risks, leaving behind only those who ignore the change signals.[39]

Such tempered optimism continued in Heikkinen's study[40] of the differences in newspaper readers' orientations toward videotex. The findings suggested that, depending on user information need, complementary use of newspapers and videotex will be more likely than use of either medium alone but that those who favor videotex will grow in number.[41]

Theoretical Implications

The researchers reviewed several research studies in an attempt to build a theory of technological impact on newspaper management. The studies can be grouped into eight general categories: (a) Technology influences organizational change and thus organizational behavior. (b) People affect organizational change. (c) An interaction between technology and people affects organizational change. (d) Technology diffusion is a manifestation of organizational change. (e) Technology diffusion and use are influenced by the perceptions of those who use the technology. (f) Management influences the rate of technology diffusion. (g) Task and its compatibility with technology influence technology diffusion. (h) Different technologies have different impacts. The studies can be further classified into technological, socio-technical and structural categories.

These categories correlate in their concern for technological diffusion and change and prompt several questions: Why are certain technologies adopted at a faster rate than others? Because they are compatible with job tasks of those who direct their use and of those who use them. Why do these tasks have any bearing in the matter? Because technologies are tools, means to an end predetermined by management and user values. Why are these values important? Because work is a value-laden and value-driven activity.

Indicators of these values often include social, personal, or technical needs. Indicators of these values also may include the political-organizational or economic needs as well as prior work experiences. Or these indicators could implicitly symbolize a cognitive cost-benefits analysis[42] at work among employees as well as among managers. In a broader sense, as Argyris[43] mentioned and as the economic analysis of Stoneman[44] confirmed, these values may appear in a dynamic learning experience leading the user to update his ideas that will in turn update his desired level of use of the technology. Rogers called this phenomenon "interconnectedness" or "the diffusion effect": the cumulatively increasing degree of influence upon an individual to adopt/reject an innovation, resulting from the activation of peer networks about an innovation in a social system.[45]

One also may approach the categories via the innovation process stages/attributes perspectives given by Rogers.[46] Who puts change on everyone's agenda? Management, which then matches the organization agenda with the technology. After this matching, whose decision is important? The users, who, through experience with the technology, practically "reinvent" the technology to fit to themselves (i.e., the organization). Their perceptions of their tasks and their experience-driven perceptions of the technology play key parts in this "re-fit." What becomes of this "reinvention"? Management clarifies this relationship, making the meaning of the technology more clear to organization members. What does this meaning become? Routine, work, the job; the technology loses its separate identity and the organization changes, adapts to and assimilates the technology.

However, both these approaches are somewhat inadequate. For example, Rogers gave insufficient attention to the user's task and technology's impact on that task, preferring instead to dwell on social impacts and to give them a three-fold categorization.[47] In a later work,[48] Rogers touched on decentralization/centralization as an impact, saying a new communication technology can do either, depending on its use.

Similarly, the organizational-hierarchical approach lacks sufficient concern with technological types or typologies as used by others. Although user task perceptions would indirectly address the issue, they leave no room for primary attributes as mentioned by Downs and Mohr or for comparative (across-technology, across-organization) research.

The remedy may be reached by viewing Eason,[49] who proposed a theoretical framework (see Figure 2.1) that viewed usability (adoption) as a product of the interaction of three variables (environment/system, task and user), which then feed into the user's response to each task episode. Eason saw the *system* as the principal causal factor but its usability was conversely seen as dependent upon task and user variables. The three factors came together to provide the context in which the user makes his judgment about how he will proceed with his specific task. The user appears to unconsciously make a number of cost-benefit assessments. A series of cost-benefit decisions establish a knowledge base of task-system connections, causing an overall strategy of use to emerge.[50]

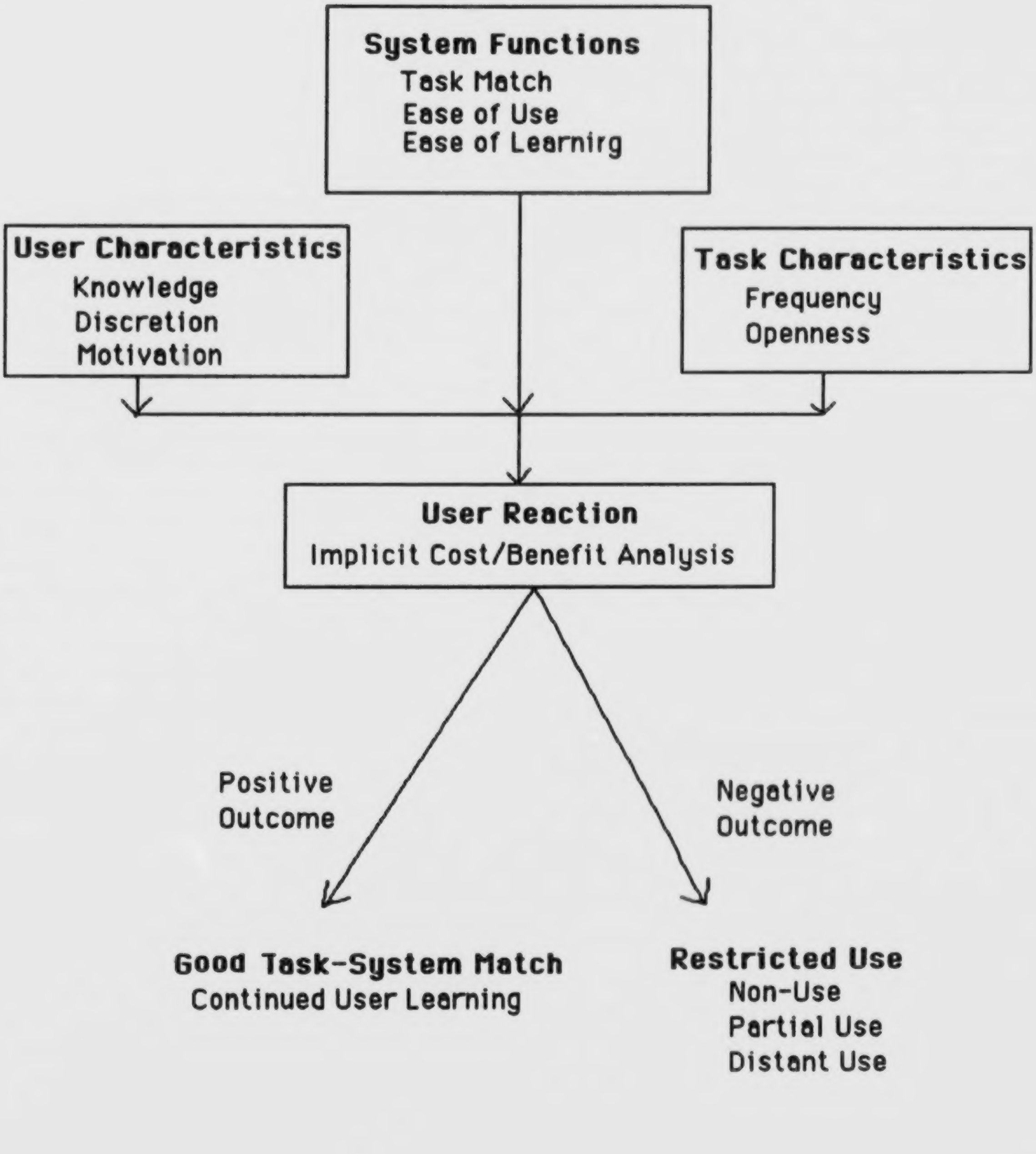
Robey[51] indirectly supported this idea of system, saying that research on computerization's impact on management structure should focus away from conceptual and methodological rationales centering on technology as the sole cause of change. Structure does not primarily depend on any internal technology, but rather on the nature of the task environment. Danger lies in considering an overall impact of computerization, for example, because there are so many different functions which computers can perform. Where task environments differ for different organizational functions, interorganizational structural differences also may exist.[52]

Rousseau[53] also took the open systems approach, reasoning that the environment shapes the organization's technology in at least two ways. First comes the relationship of the environment to input-output activities; i.e., an organization processes materials (in the case of the newspaper, these materials are information) from the environment and disposes of products (the newspaper) back to it. Second, there is the effect of the technological environment and management's perceptions of the environment on technological choice. Technology -- as strategy -- reflects a choice about the appropriate ways of providing a product or service. Technology is not a given, but reflects choices made by managers. Moreover, market conditions, costs and competition influence the feasibility of various alternatives.[54]

But the environmental/system framework creates methodological problems in measuring usability and causality, not to mention the impact (in this case, "feedback") on management and on

Figure 2.1

Eason's Causal Framework of Usability


System Functions
Task Match
Ease of Use
Ease of Learnirg
User Characteristics
Knowledge
Discretion
Motivation
Task Characteristics
Frequency
Openness
User Reaction
Implicit Cost/Benefit Analysis
Positive Outcome
Negative Outcome
Good Task-System Match
Continued User Learning
Restricted Use
Non-Use
Partial Use
Distant Use

management's job. Stewart,[55] in examining six British firms' use of computers, found that the nature of the impact varied because of differences in the type of computer application, in the method of organizing the computerization process and in management's use of the system. Most effects were minimal or marginal[56] -- a fact that Diebold[57] blamed on the method of selection of companies, few of which implemented more advanced computer applications.

Earlier and later studies found significant results, however. For example, in one highly automated power plant,[58] supervisors' roles changed from a very involved, hands-on state to a maintenance, coordinating and monitoring state. A more recent study[59] discovered implementing a computer system in a railway freight company blurred some of the traditional distinctions between first-line supervisors and superordinate managers. Supervisors, instead of being concerned with parochial problems, were required (via computerization) to have a *much broader* perception of their local operating systems and the consequences of their actions *beyond that local system.*[60]

Summary

Zalewski[61] argued that as technology advances and the processes of production become more complex, the manager-employee relationship changes. Whereas previously the employee did not possess skills or knowledge which his supervisor did not possess, today's manager often will not possess the skills of those working under his supervision and must, instead, possess quite different skills. "Supervision remains essential," Zalewski said, "but it is the final results rather than detailed operations that must be supervised in advanced stages of automation." [62]

The researchers have sought to present previous research and related theory as they concern technology and its impact on organizations, particularly management-employee relations. A review shows that most studies worked within three contexts and yielded varying results on different levels of analysis. While incomplete, previous research does provide a frame of reference.

Three areas dominate current research in this area. The structural area focuses on the management of change and the change in management via the impact on formal devices such as rules and organizational hierarchy. This school of thought sees technology as a planned, controlled instrument of management, which makes conscious decisions concerning technological implications.

The second area concerns socio-technical research, stressing that the needs and actions of those who use the technology -- in concert with attributes and characteristics of the technology -- ultimately determine the impact of the technology on the organization. Man and machine mutually interact to the benefit or detriment of the organization. Technology is dynamic, changing in purpose and utility according to its perceived utility.

The final area centers on the technology, emphasizing that technology has a certain, observable, direct impact on the employee and on the organization. Changes occur when the technology is introduced. Technology is the independent variable and "determines" a response in the organization.

Each area has advantages and disadvantages that -- when applied to newspapers and their managements -- are not clear. Whether the lack of clarity happens because of the varying technologies used by newspapers or because of the uniqueness of each newspaper or because of some other factor is a question that will be analyzed by the current study.

To arrive at a more testable theory, there should perhaps be an emphasis away from the concepts that previous research seems to stress and toward the concept of managerial, environmental, technological and employee functions/changes -- variables within and across organizations -- as the interdependent units. The following chapter will show how these functions can be explored.

CHAPTER THREE

RESEARCH QUESTIONS AND METHODOLOGY

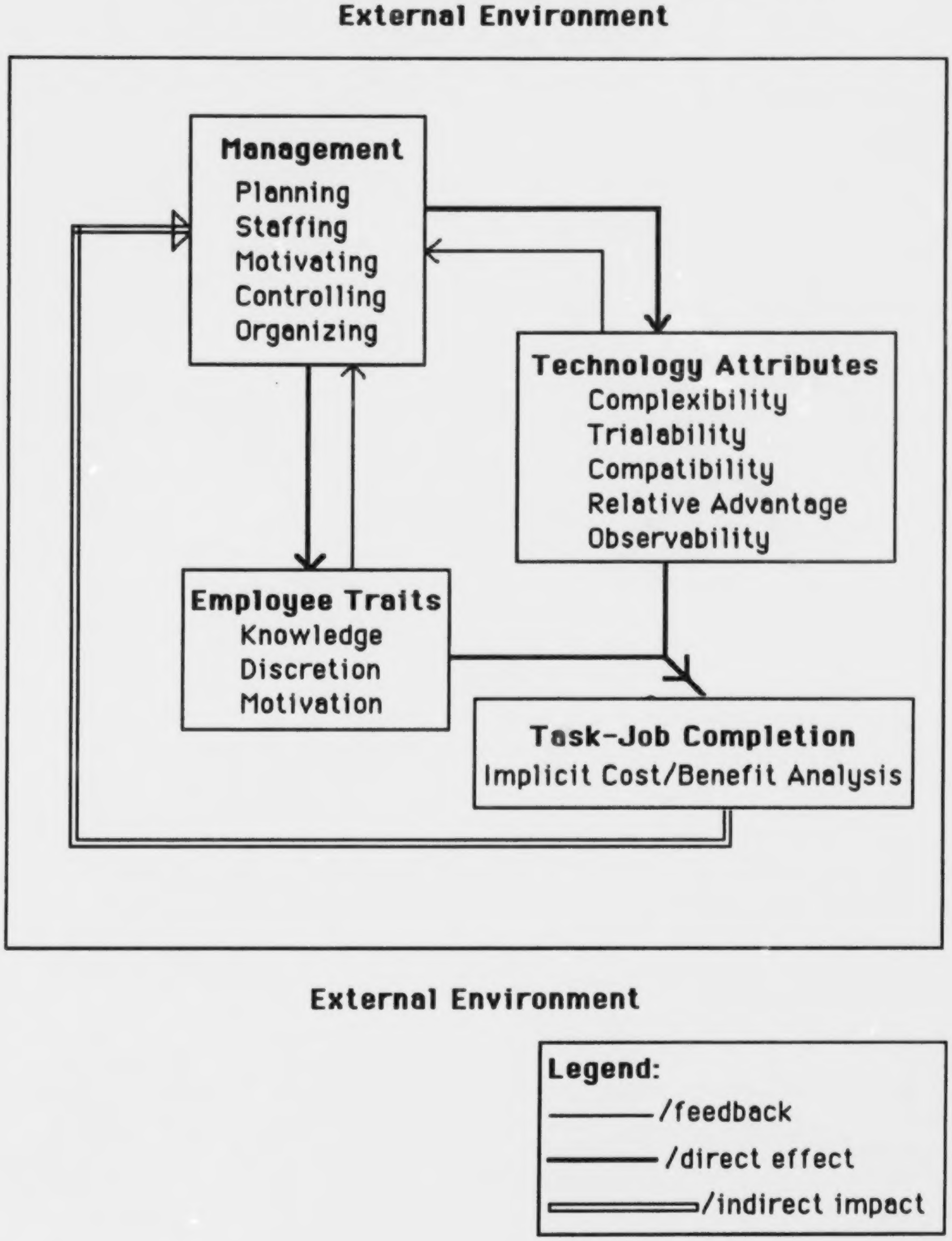
Eason's approach to the study of diffusion can be used to investigate the influences of technology on newspaper management. The researchers believe that the managerial impact of technology can be predicted by using the knowledge and perceptions of the task and technology of those who use the technology and by considering the organizational and external contexts. In order to integrate the various theoretical approaches and findings with this theory, Eason's framework (see Figure 2.1) has been expanded and modified (see Figure 3.1) to explain influences on management at different levels of analysis: managerial, employee, technology and environment. The researchers offer the following list of assumptions and theoretical statements for investigation.

Assumptions

- *For various reasons and objectives, an organization's management chooses to introduce technology.* Companies use new technology to obtain strategic, operating or control objectives and management determines many choices of work and of work organization.[1] Technology is a tool to be selected and used by management, which does not operate in a vacuum but responds to internal and external environments as well as plans and goals.
- *Technology is introduced to organization members, who interact in various ways with the technology.* Consequences can be either direct or indirect, desirable or undesirable, anticipated or unanticipated.[2] In addition, these interactions can be mental or physical, pleasant or unpleasant, work or play, etc. All reactions are expected in a wide range of areas. Employees voluntarily or involuntarily respond positively or negatively. Regardless of the attitudes involved, a response or interaction occurs.
- *The interaction is determined in part by the job and task characteristics and values of the user of the technology and attributes of the technology itself.* Various researchers[3] have lent credence to the importance of these factors in the diffusion process. This interaction is likely to be fed back to management in terms of costs and benefits. Job-task, values and technological attributes come together to provide the context for the interaction -- the user's judgment (a personal cost-benefits analysis of sorts) about how he will proceed with the specific task. This is a repeated assessment as the task needs change.
- *The resulting interaction influences management's perceptions of the technology's usefulness and adaptability.* The organization gains experience that will lead it to update its ideas on employee use of the new technology.[4] This in turn will lead the organization to modify the desired level of use of the technology. This "learning mechanism" self-adjusts at less-than-infinitely fast speed. Organizational capabilities, development risks and other factors help shape management's perceptions.[5] These ideas appear as corporate cost-benefit ratios or "project profitability."
- *Management's perceptions cause it to redefine its objectives and adjust or restructure the role of the technology to the organization.* Once the perceptions form, management uses various methods to reinforce or readjust its technological priorities. Relationships between technology and job content or between technology and organization structure may be mediated by management assumptions, deductions and objectives.[6] Such mediation may be drastic or gradual, depending on the organizational circumstances.
- *These management actions lead to clarification of the technology's organizational meaning to members/users.* "Clarification" means that as the technology becomes integrated into the day-to-day operations of the organization, its meaning gradually becomes clear to employees.[7] But others referred to this as the "selling job" or persuasion that management must execute if employees are to "buy"

Figure 3.1

A Causal Framework of Technology Impact


External Environment
Management
Planning
Staffing
Motivating
Controlling
Organizing
Technology Attributes
Complexibility
Trialability
Compatibility
Relative Advantage
Observability
Employee Traits
Knowledge
Discretion
Motivation
Task-Job Completion
Implicit Cost/Benefit Analysis
External Environment
Legend:
/feedback
/direct effect
/indirect impact

the technology.[8] Regardless of interpretation, the technology loses its newness and becomes embedded in company operations.

- *This re-education of members/users will mean a change in technology perceptions, which best explain job performance and technology interaction of the members/users.* Re-education is not a teaching of new skills, but rather a changing of the interactional structure of the organization. Most often devices such as rules, new job descriptions or rewards of some kind can bring about these changes.[9] Whatever the method, as Eason says, the change will impact user and task characteristics, which in turn will impact technology use.[10]

- *Management must constantly adjust to those performances and, in this case, to the employee-technology interaction.* Adjustment, by nature, is management. Typical managerial functions often include *planning* (deciding what objectives to pursue and what to do to achieve them), *staffing* (determining human resource needs, recruiting, selecting, training and developing human resources), *organizing* (grouping and assigning activities, providing the authority to execute them) *controlling* (measuring performance against objectives, determining causes of deviations and taking corrective action) and *motivation* (directing and channeling human behavior toward the accomplishment of objectives).[11] Introducing technology mandates the use of one or all of these functions at some time in the diffusion process. The key managerial issue becomes when to perform which function. Function, then, reflects the adaptability of the technology as mediated by other factors.

- *The organizational and industrial environment interacts with the technological, employee and managerial assumptions above.* Technological impact assessment should not be done without an extensive assessment of environmental factors.[12] The environment often indirectly shapes the technology via management perceptions and judgments about such things as competition, market share and legal requirements. One should also consider the internal environment of the organization.

Combining all of the above assumptions necessitates reassessment of existing research. In this case, the framework exists in Eason's causal framework of usability and the emphasis on environmental factors in technological assessment.

Rousseau advocated an open systems perspective, reasoning that technology -- as transforming input into output -- is open and responsive to environmental influences. An open systems approach would involve detailed assessment of input and output activities, emphasizing transactions among organizational employees, groups and other organizations and their respective environments. This approach assumes a dynamic organizational environment.[13]

Adapting this approach to Eason's framework would result in something similar to Figure 3.1, viewing the task as a product of the interaction of management, employee and technology -- which then feed into the user's response to each task. As the main factor, management can be manipulated to improve usability via management's interaction with employees and its ability to control the technology.

However, these variables -- before merging -- receive input or are affected by the environment to varying degrees. Once they are merged, the employee/user makes certain cost-benefit decisions. Thus, such action produces output -- a positive or negative outcome.

This study, in examining technological impact on newspaper newsroom management, then becomes an exercise in determining the degree of impact of the three categories and of the environment. This analysis, however, begs additional focus.

As mentioned earlier, many newspapers purchase new technology primarily for enhanced production purposes. But cost savings or profits usually motivate this decision. Using Rogers' list, relative advantage and compatibility most closely resemble this motivation.

Rogers defined relative advantage as the degree to which an innovation/technology is perceived as being better than the idea it supersedes. He defined compatibility as the degree to which an innovation is perceived as consistent with the existing values, past experiences and needs of potential adopters. Both attributes are economical, owing their existence to comparisons. In comparison to Rogers' other technology traits, they are the attributes that most newspaper publishers likely will consider in making technology purchases.

Under the above assumption, then, management becomes a function of relative advantage and compatibility; i.e., editors most likely will attempt to implement a certain technology with these two attributes uppermost in mind: Is the technology better or worse than its predecessor? How well does the technology conform to what the newspaper staff has become accustomed and come to value and need.

This study's focus on post-adoption technological impact on management, however, eliminates the study of certain managerial functions. Planning, staffing and organizing usually are pre-adoption functions of the manager; i.e., the manager ideally attempts to use these abilities in anticipation of a change or an event, such as the adoption of a new technology. Therefore, the post-adoption managerial functions largely concern controlling and evaluating the technology and its use, and motivating employees to use and adopt the technology.

Therefore, this study will attempt to show that *the greater the relative advantage and compatibility of a technology, the less likely will the manager need to pursue motivational and controlling measures in getting subordinates to adopt the technology.*

Similarly, this suggests that greater relative advantage and compatibility of a technology facilitates journalists' work. That is, if a copy editor has a more efficient page layout terminal or if a reporter has a more complete and flexible word processor, both will be able to do a better job and, as a result, the content of the newspaper will be "better," in the sense that the journalists perceive as such. So this study also will attempt to show that *the greater the relative advantage and compatibility, the more the newspaper's content will be perceived to have improved; in other words, journalists will believe that the newspaper's quality will be enhanced.*

Pursuit of the veracity of these hypotheses necessitated several research questions (listed below) about each area.

Management

How has the technology changed the manager's job?
How has the technology changed how the manager motivates staff?
What staffing changes have been made because of the technology?
How has the technology changed how the manager organizes staff?
How has the technology changed how the manager evaluates and monitors staff?
How has the technology affected the manager's planning methods and decision-making?
How has the technology changed the manager's overall job performance and requirements?
How much additional training has the manager needed?
How have the manager's superiors and subordinates reacted toward the manager's work since the technology was adopted?
How has the technology affected the manager's interaction with staff?
What have been the managerial costs/benefits of the implementation?

Employees

How has the technology changed the employee's job?
How has the technology changed the employee's attitude toward the job?
How has the technology affected the employee's attitude toward any immediate supervisor(s)?
What skill changes have been mandated by the technology?
How has the technology affected the employee's job performance and requirements?
How much additional training has the employee needed in light of the new technology?
How have the employee's immediate supervisor and co-workers reacted toward the employee's work with the new technology?
How has the technology changed the employee's interaction with supervisors?
What have been the costs and benefits of the new technology?

Technology

How does the technology affect the newspaper's daily operations?
How does the technology work?
Under what priorities, goals and objectives does it operate? How effective and efficient is it?
How and why was the technology selected by management?

Where on the diffusion curve does the specific technology fit?
What kind of trial run did the technology undergo? How much preparation did implementation require?
What are its capabilities? What is its future in the organization?
What are its advantages/disadvantages compared to other systems?

Environment

How has the technology changed the competitive environment of the newspaper? Its financial condition?
How has the technology affected the size, organizational structure or the daily operational constraints of the newspaper?
How does the technology change the market of the newspaper?
What effect does the technology have on newspaper cost, content emphasis or editorial makeup?
Are there any unions? If so, what has the technology done to their relationship with management?
What other internal environmental relationships are affected by the technology? What is the effect on the general managerial climate?
How has the technology affected managerial attitudes toward technological innovation?

Methodology

The researchers selected a case study approach primarily because the study's aim -- to investigate organizational impact of emerging technologies in newspapers -- does not require control over behavioral events and because the case study method is preferred in examining contemporary events.[14] The present study attempts to discover the how and why in these issues. Restated, the relevant issues appear to be:

1. How has the specific technology changed the nature of work of the newspaper manager?
2. How have employees and the environment interacted with the technology? Why have they interacted in this way?
3. How has that interaction affected newspaper management?

These issues are at the center of the research questions previously listed. These questions deal with operational links needing to be traced individually, rather than frequences or incidence.[15] Knowing "hows and whys" necessitates a wider array of data -- interviews, observations, documentation -- than other methods provide.

To answer these questions, information about technological impact was needed from staff members of a newspaper involved in implementing the specific technologies. This specification was necessary because the researchers desired a detailed knowledge of the organizational dynamics occurring after the technology's adoption.

Also, the researchers designed the study so as to examine the issues in a natural, rather than artificial or contrived, setting. In addition, procedures permitted unobtrusive observation of members' performance and reactions to the technology.

And almost as important, the procedures had to permit the development of observer/interviewer-observed/interviewee rapport that could be maintained for the duration of the study. The researchers believed that a variety of techniques were necessary not only to gather the different data but also to help verify data reliability. The researchers believed, as did Katz et al.,[16] that the case study method fully utilized "the advantages of seeing the situation as a whole and of attempting to grasp fundamental relationships. From this ... can come the insights which can furnish the hypotheses for later, more detailed, quantitative study."

The study began by identifying the eligible technologies.

Technologies

Because the study aimed to investigate organizational impact of emerging technologies, selecting those technologies was particularly crucial. The researchers developed the following requirements to aid the process:

> **1.** The technology studied should be possible to observe at the routinized stage. In many technological applications, it would not be possible to observe this stage because they are relatively new to the market. It was decided to study the routinized stage because it was likely to give subjects greater time to formulate a judgment with proper perspective on the impact on managerial work.
>
> **2.** The technology studied should have a pervasive impact on the organization either in terms of numbers or as it concerns management. Some technologies apparently have limited impact. For example, desktop publishing seeks to eliminate and consolidate publishing operations, thus creating small staffs and fewer managers. On the other hand, online information retrieval systems are used by large numbers of reporters but have no foreseeable managerial impact since they are, by and large, reporting tools.
>
> **3.** The technology studied should be predominantly and directly controlled by editorial personnel. Most of the newspaper trade press' technology discussion centers on technologies such as desktop publishing and new kinds of presses. These primarily are production technologies that indirectly affect editorial management. One could consider pagination in this category except that it is controlled by news personnel and is also an important editorial tool.
>
> **4.** The technology studied should be "emerging," i.e., not in widespread use. This would exclude such current technologies as VDTs and lap computers, which have been adopted by many newspapers.
>
> **5.** The technology studied should be in use at a daily newspaper. This would assure that the technology is being regularly used and that the users have adequate experience with the technology so as to be able to form a knowledgeable opinion about it.

These criteria yielded three technologies for study: videotex, pagination and personal computer networks. The next methodological step involved identifying the participating subjects and their employers.

Subjects and Procedures

The researchers developed a detailed case study protocol, which began with identifying and soliciting participation from three newspapers. On-site visits, lasting about one week each, were arranged at each newspaper.

The researchers selected three U.S. newspapers -- *The Fort Worth Star-Telegram* (videotex), *The Beaumont Enterprise* (pagination) and *The Amarillo Globe-News* (personal computers) -- for inclusion in the study. According to the study criteria, each newspaper must have adopted or be engaged in the adoption of one of the emerging technologies under study. No technology studied at one newspaper was studied at another newspaper.

Newspaper selection was initiated by the researchers via telephone or personal conversation with executives of the newspaper. The researchers explained the purpose and background of the study and then sent potential participants a followup letter outlining the study's formal goals and aims and explaining the kind of participation expected from the newspaper.

The researchers followed the letter with a confirmation telephone call and suggested tentative dates for conducting the study at that particular organization. Agreement was reached and permission granted to spend at least a week at each newspaper. Visits were scheduled for May and June of 1987 and significant contacts were established at each participating organization.

Practical considerations -- primarily convenience, access and geographic proximity -- limited the case selection; thus all newspapers were in Texas. The researchers intended that results analysis would yield hypotheses that might be tested more rigorously by a later, followup study.

Once one of the researchers arrived at the newspaper, agreement was reached on a detailed interview and observation schedule. It also was agreed that a specific newspaper manager would serve as the author's mediator, coordinator, information guide, sponsor or in any other capacity that facilitated the study. These preliminary procedures followed the plan below:

I. Procedures

A. Initial Scheduling of Field Visit:

Review of Preliminary Information
Verification of Access Procedures

B. Determination of Persons to Be Interviewed and Other Sources of Information:

Supervisory Personnel
Task Personnel
Executive Personnel
Pertinent Records, Documentation
Observations

C. Scheduling Data Collection Activities:

Interviews
Observations
Records, Published Information

D. Provisions for Unanticipated Events:

Availability of Interviewees, Records
Obtrusiveness of Interviewer

Subjects included those publishers, editors and newsroom supervisory staff involved on a regular basis in the planning, staffing, operation, adoption or implementation of the specific technology as well as newsroom employees whom their superiors classified as regular users or operators of the technology.

Obviously, the number of subjects varied with the various technologies. For example, pagination requires relatively small staffing to operate. The opposite, to some degree, is true of the other technologies. The researcher noted the effects of these variables.

The research questions developed in the previous section were discussed with experts in academia and in industry as well as with financial and management consultants and then revised for the study. The researcher then used the research questions as a base in interviewing supervisory personnel for managerial response to the technology. Additional questions were open-ended, so as to elicit as much information as possible.

In addition, separate interviews with employee/users were conducted using the appropriate research questions as a base. As many managers and employee/users as possible were interviewed during the time allotted. An example of these questions and the operational details they involved follows:

QUESTION: How is *The Star-Telegram*'s videotex operation organized?

Sources of data:

- -- videotex general manager
- -- executive editor
- -- videotex reporters and staff
- -- organizational chart

Sample strategies:

- -- Obtain or draw an organizational chart that shows the location of the videotex offices
- -- list the type and number of videotex administrative and non-administrative personnel
- -- to whom does the videotex general manager report?
- -- who reports to the videotex general manager?
- -- whom does the videotex general manager supervise?
- -- what kinds of decisions does the general manager have to sign off and with whom?

Such questions were contained within the much larger protocol framework, which as outlined below, initially focused on the technology and then centered on managerial, employee and environmental interaction with the technology:

II. Case Study Protocol and Questions

A. Definition of the Technology "System"

General Operational Background
History and Innovation Process
The Newspaper
The Community

B. Methodology

C. Operators/Employee Users and System

Impact (Direct, Indirect) on Work

D. Managers/Supervisors and System

Impact on Work (Direct, Indirect)

E. Environment and System

Impact on Work

A complete description of the questions, guidelines and protocol is presented in the Appendix. The researcher also directly observed the technology, managers and users.

In order to help the researchers measure the degree of relative advantage, compatibility, motivation and control and to arrive at an idea of their perceived effect on editorial content, it was necessary to operationalize those indicators. This was achieved by constructing an indicator index for each variable. The researchers listed, revised and developed a list of questions for each indicator/variable. Each question could be answered "yes" or "no." The answers then were coded as to whether they were positive or negative in the context of the variable itself.

For example, a "no" answer to the relative advantage question, "*Is there less work than before for the managers?* " was considered a negative response. Only positive responses -- in the sense of being to the advantage of the newly adopted technology -- were counted for the relative advantage, compatibility and editorial content variables, with the total number of positive responses divided by the total number of responses possible for that indicator/variable. The resulting percentage was called, for example, the relative advantage "score" for the particular technology.

The process was reversed, however, for the motivation and control variable indicators, with the total number of negative responses -- i.e., "negative" in the sense of the amount of motivation and the amount of control necessary -- being divided by the total number of responses possible for those indicators.

The researchers arbitrarily selected 27 as the number of questions for the relative advantage and compatibility indicators and 32 as the number of questions for the motivation, control and editorial content indicators. Responses were based on the visiting researcher's observations, notes and comments from employees of the participant newspapers.

On the relative advantage, compatibility and editorial content indicator lists, an asterisk beside the number of the item indicates that a "yes" response to that item was considered to the technology's advantage in that situation. Those items without an asterisk would have necessitated a "no" response for the item to be considered to the technology's advantage. The total of appropriate "yes" and "no" responses, then, was then divided by the total number of items to achieve the index score for each of those variables.

Although the same coding process was followed on the motivation and control lists, the index score was computed differently. For example, if a motivation item list indicated that 28 of the 32 items were favorable, instead of using the favorable answers to construct the score, the number of unfavorable responses were used to indicate the amount of motivation or control needed, in accordance with the relationships examined by the study.

A complete listing of the questions and results for each indicator/variable appears in the individual case chapters.

Analyses

Results were analyzed according to Yin's[17] tactics. For example, multiple sources were used, a chain of evidence established, patterns matched. Such analytical generalizations attempted to generalize from the case results to broader theory. Conclusions specified only what the evidence supports.

CHAPTER FOUR

CASE 1: VIDEOTEX AND *THE FORT WORTH STAR-TELEGRAM*

Definition of the Technology "System"

The Community

Fort Worth is the fifth largest city in Texas with a 1980 population[1] of 385,164. Often combined with Dallas to form "the Metroplex," Fort Worth lies about 20 miles west of its sister city in north central Texas.

Of the city's nearly 180,000 working adults, more than 100,000 work in technical, sales, administrative support and "blue collar" jobs. Fort Worth offers largely service- or manufacturing-oriented jobs.[2]

A diverse economy helped the city withstand the problems that beset other Texas communities when the price of oil declined in the early 1980s.[3] From 1984 to 1986, the city attracted new industry and added more than 2,000 jobs.[4] That and other successes were prompted by a 1982 survey, which revealed that much of the country knew nothing of Fort Worth.[5] Area leaders -- including the publisher of *The Fort Worth Star-Telegram* -- then organized to launch a national public relations campaign to lure new businesses.[6]

The local economy remained healthy from 1980 to 1985 because of its diversity: retail trade, manufacturing, convention/tourism, agribusiness, wholesale distribution and banking. Much of the city's manufacturing growth followed the evolution from cattle to railroads, oil discoveries to oil-field equipment and aircraft production to high-technology industry.[7] In 1985, the local unemployment rate was 5.2 percent -- an increase from the 4.1 percent level of 1980 but lower than the statewide level of 6.3 percent.[8] But the economy worsened in 1987.

The Newspaper

Fort Worth has only one daily newspaper, *The Fort Worth Star-Telegram*. The newspaper publishes morning and evening editions, as well as Saturday and Sunday issues. The combined weekday circulation in 1986 was 257,991 while the Saturday and Sunday circulations were 261,235 and 306,548, respectively.[9] As of May 11, 1987, the totals were 265,744 for the combined daily, 263,604 for Saturday and 317,098 for Sunday.[10]

Capital Cities/ABC bought *The Star-Telegram* and two local radio stations from Carter Publications, Inc., in 1974 for more than $75.5 million in cash and notes.[11] The newspaper is one of nine daily newspapers owned by Capital Cities, which also owns 40 weekly community newspapers and shopping guides as well as the ABC television network.[12]

As the nation's leading media company in terms of revenue,[13] Capital Cities had 1986 revenues of more than $4.12 billion. The company, however, experienced a decline in operating income in its publishing segment, largely because of poor results from its many publications, including *The Star-Telegram*.[14]

The slumping Texas economy forced newspapers to monitor more closely and thus curtail their operations. For example, although *The Dallas Morning News* increased its advertising market share, it laid off 69 full-time and 26 part-time employees May 13, 1987. In December 1986, the newspaper had already cut 20 employees in an early retirement plan. In September 1986, just before Times Mirror completed its sale to William Dean Singleton, the rival *The Dallas Times Herald* cut its workforce by 109 full-time employees.[15]

The Star-Telegram, which employs about 1,200 persons, planned to cut expenses by $2 million to $2.5 million through 1987 via several austerity measures: freezing salaries indefinitely, halving the traditional employee Christmas bonus, eliminating the company's annual summer picnic and reducing newsprint use. The paper expected to lose about $1.5 million in revenue because of the closing of Safeway grocery stores. The Fort Worth Gold and Silver Exchange, another major local concern, filed for re-organizational bankruptcy, leaving *The Star-Telegram* and other creditors unpaid.

Although *The Star-Telegram* is the only daily newspaper in Fort Worth, it competes heavily with the Dallas dailies. Advertisers often believe they can adequately expose their product to the Metroplex by taking one Dallas paper and adding *The Star-Telegram* to the schedule. Some buyers consider the newspaper important because neither Dallas daily boasts substantial circulation in Fort Worth and because *The Star-Telegram* has stronger coverage in the area between Dallas and Fort Worth.[16]

History and Innovation Process

Videotex technology has spurred much investment and speculation within the newspaper industry.[17] But great disappointment often occurred amid great expectations.

For example, The Times Mirror Co. closed its Gateway service in March 1986, days before Knight-Ridder Newspapers, Inc. announced it soon would be closing its Viewtron operations. Spokesmen concluded that the videotex market grew too slowly to justify continuing costs.[18] Knight-Ridder said it had spent about $50 million on Viewtron in the project's six-year history while Times Mirror spent an estimated $30 million on Gateway. In contrast, Startext, the consumer videotex of *The Star-Telegram* announced that its revenues had pulled even with costs.[19]

Compared to the Viewtron and Gateway budgets, Startext's finances were relatively small -- some $210,000 in capital investments through April 1986, operating losses of $129,000 before the break-even point (some of the initial staff departed because of what they felt was the smallness of the operation and the restrictive nature of its resources[20]) -- although another source had predicted capital investment and cumulative losses to have reached $500,000 two years earlier.[21] But from the beginning, the venture was unique.

In September 1981, Fort Worth-based Tandy Corp. approached *The Star-Telegram* with the idea of testing a videotex service. Under the arrangement, the newspaper provided information and Tandy provided the service/technical management. As an attempt to "bring news to the screen," Startext began May 3, 1982, offering subscribers unlimited access to 2,000 frames of information for $5 a month. After five months of operation, the service had only 36 subscribers -- the same total it had after about a month.[22]

In addition to access being limited to certain Tandy computers, Startext service came only frame by frame. If the subscriber requested a news story, the service would provide the story and then disconnect the access. If the subscriber wanted to see a second news story, he would have to repeat the access procedure. So in September 1982 at the urging of the newspaper, Tandy developed software that made Startext available to owners of any computer. Startext ended that year with 261 subscribers.

But the increasing audience proved too much for the Tandy software system. Each time the system downloaded or "crashed" the entire database had to be reloaded, creating delays and consumer complaints. In January 1983, Tandy and newspaper officials met to attempt to improve the system's reliability. Tandy relinquished the service to the newspaper, which had developed a somewhat similar software on its in-house computers as a backup.

Since then, subscriber levels have reached about 2,800 out of a potential 65,500 households in Tarrant and Dallas counties. Some 68 percent of the 2,58[illegible] 1986 year-end subscribers lived in Tarrant County while 32 percent resided in Dallas County.

Startext officials, from the start, kept their expectations low in regard to subscriber levels. One report said they expected gradual growth and conceded that it would take several years to establish a solid following[23] while another took note of the "chicken and egg" nature of the product:[24] "We can't provide the service until we have subscribers and we can't get the subscribers until we have the service. We are going in slow -- building as subscribers grow."

The newspaper operated the service, in the words of a current executive, unlike Gateway and Viewtron:[25]

> Our approach from the beginning was to treat it as a business, not as an experiment; but at the same time, (to) treat it as a risky or speculative business and to not

> commit tremendous amounts of resources -- either people and/or capital -- and just to see if it would work....We never couched it in experiments....We never said, "It's OK to fail."

But in 1987, Startext, as well as *The Star-Telegram* and its competitors, operated in the sea of economic uncertainty.

Management has evaluated Startext from the standpoint of its profitability, subscriber levels and the acceptance of new services. Current success in those areas indicated that Startext is a viable business, more than an experiment. Still, the short-term goal is to get a good mix of services so as to appeal to each subscriber. There are many potential services for Startext; however, Startext must walk an economic tightrope of offering a service that doesn't use much computer time while simultaneously having some value to subscribers because there is no charge for connect time. That situation prompted management to go slower with Startext than some hoped and, as a result, there is no formal timetable. "We'll grow it as it makes sense to grow," said the Startext executive.

Profitability figures, costs and revenues were not directly supplied to the visiting researcher. Startup costs, however, were estimated at $250,000 and initial annual cost projections were estimated near $60,000. As of May 11, 1987, the service had 2,743 subscribers, paying an annual $119.40 basic rate on a quarterly, six-months, nine-months or yearly basis. That equaled about $327,000 in revenue for the calendar year. However, that figure would fluctuate, depending on the number of additional services the subscriber used and to what extent they were used. So, the potential revenue could be significantly higher, since at least 2,665 users subscribed to at least one service beyond the regular Startext service.

Although the service has potential, management saw limits. For example, videotex requires some effort on the user's part. Only so many people -- those willing to put out the effort -- will use the service. "It's not going to be in 80 percent of the homes," said the executive. "It might be in 10 percent of the homes." The general manager also reasoned that marketing and promoting Startext with hopes of increasing subscriptions to, say, 10,000, would necessitate increasing, upgrading or improving the software architecture/capacity and organizational infrastructure to handle the extra load.

Videotex still is seen, however, as a viable way for a newspaper to diversify and hone its competitive edge, although other newspapers per se are not seen as the competitors. Some services could be offered by other agencies, but probably none could match a newspaper's news-gathering prowess nor its classified advertising base. But newspapers would have to diversify into transactional services if they are to push videotex in the direction in which *The Star-Telegram* management desires.

In its venture, *The Star-Telegram* has changed its audience somewhat -- from newspaper readers to an audience that reads the newspaper and uses videotex. It is important to note that the newspaper *was asked* to enter the videotex industry -- in effect, it was pushed by Tandy. After the service began, it became synonymous with the newspaper.

Consequently, the newspaper and Capital Cities now consider Startext as their own, although they viewed the first two years as an experiment. However, according to the vice president, Startext fits the Capital Cities spirit of entrepreneurship in that most Capital Cities properties get to run themselves and are not driven to a great extent by corporate edict. The operation still must be successful, but the local executives have a degree of freedom. The afore-mentioned Fort Worth austerity measures were local decisions, not corporate ones.

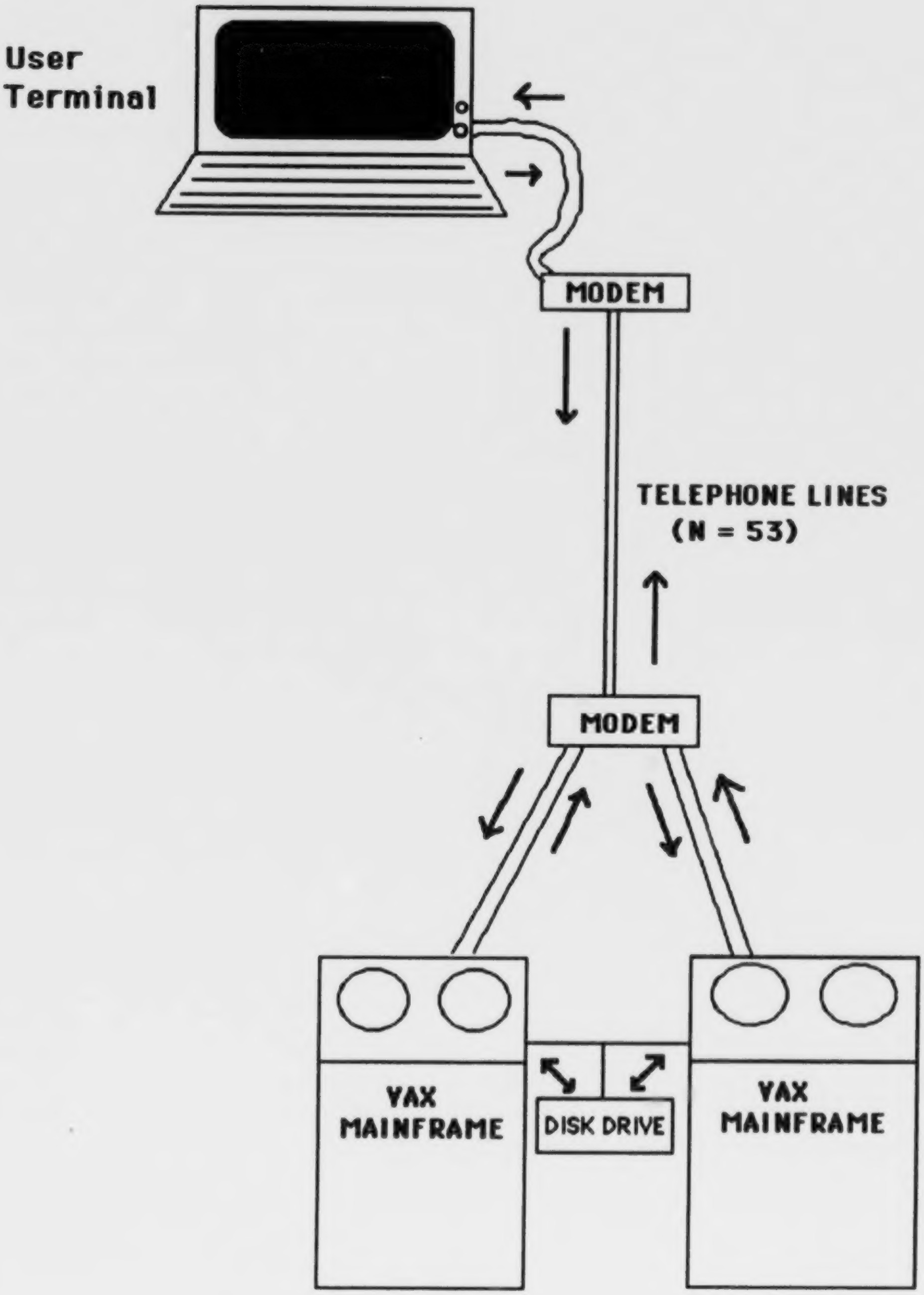
General Operational Background

Two Digital Equipment Corp. VAX 11-750 computers, each with 16 megabytes of internal memory and a gigabyte (1,000 megabytes) of external memory capacity, drive Startext. The computers -- bought in 1983 -- are capable of receiving 53 telephone lines from customers' modems (see Figure 4.1).

Startext programmers wrote the system's software, consisting of three primary programs: one each for system users, Startext copy editors and Startext internal business functions. Day-to-day operations acquired added uncertainty in April 1987 with the system software revision to accommodate credit card payments and to make subscriber access more efficient and easier. In addition, subscribers

Figure 4.1

Startext Technology Network


User Terminal
MODEM
TELEPHONE LINES
(N = 53)
MODEM
VAX MAINFRAME
DISK DRIVE
VAX MAINFRAME

had often complained about phone line problems, such as "noise" (transmission signals becoming garbled) or the shortage of access lines. In addition to updated news, the Startext system offered electronic mail, closing stock quotes, classified ads, an online encyclopedia, airline schedules, home banking and subscriber columns.

Startext, from the user's perspective, was not substantially different from regular computer terminal use. The main difference was learning the commands and key strokes that operate the Startext system.

To get started, a user must have a modem attached to his computer terminal. Once the user readies the modem terminal program, he dials one of the Startext modem telephone numbers. A few seconds after the modem connects, the user automatically receives an ENTER ID: prompt on his screen. At that point, the user enters his ID number and presses the RETURN key. Then, the user is asked his PASSWORD. The user has three minutes to make a keyboard entry. Once online, the user can begin making keyword requests. At the REQUEST: prompt, the user enters the keywords he wishes to access and presses the RETURN key.

Startext uses some 4,500 valid keywords and each service has its own set of keywords. If the user fails to make a keyboard entry in a few seconds, he automatically is "logged off" or disconnected and his session is terminated.

All computers or terminals display screen type at various sizes: 24 lines by 80 characters, 24 by 40, 16 by 64 and so on. Startext allows users to define the number of lines and the number of characters (or columns) at which the users receive data from the Startext computers.

The system also allows the user to keep track of the time spent online. Such SYSTEMSTATS include total times on the system, total connect minutes, total time in the current user session, recorded mail, mail charges, remaining balances, account expiration date, date of last session and date first subscribed.

Each Startext service has an accompanying set of commands. For example, to use the Grolier's Academic American Encyclopedia service, the user types ENCYCLOPEDIA, GROLIER or AAE at the regular REQUEST: prompt. Once inside, the user only has to type all or part of the subject area in which he is interested. The entire service cost starts at $19.95 for three hours of "reading time."

Similar functions exist for other Startext services, at varying costs. For example, each Startext subscription includes use of STARMAIL, an electronic mail system. On a monthly basis, the first 100 letters are free. There is a 10-cent charge per letter for all letters above the 100-letter level up to 250 letters. Above that level, the user is charged a quarter per letter.

For the Startext staffer/operator, the procedure gets necessarily more complex. For example, the typical Startext copy editor's job is not much different from that of normal newspaper copy editing. After a *Star-Telegram* reporter completes a news item, the Startext copy editor retrieves the story and puts it in a Startext editing file by using certain keystrokes on a VDT keyboard. The copy editor then does "a local cleanup" on the story, entering coded commands that allow the story to go to the Startext mainframe computer. When the story is "clean," the copy editor then writes a headline and assigns the story a space in one of the Startext news summary banks. The Startext copy editor, however, does somewhat less text revision and clarification because of the time factor involved. To understand the reasoning behind the job execution, consider the entire job process and its origins.

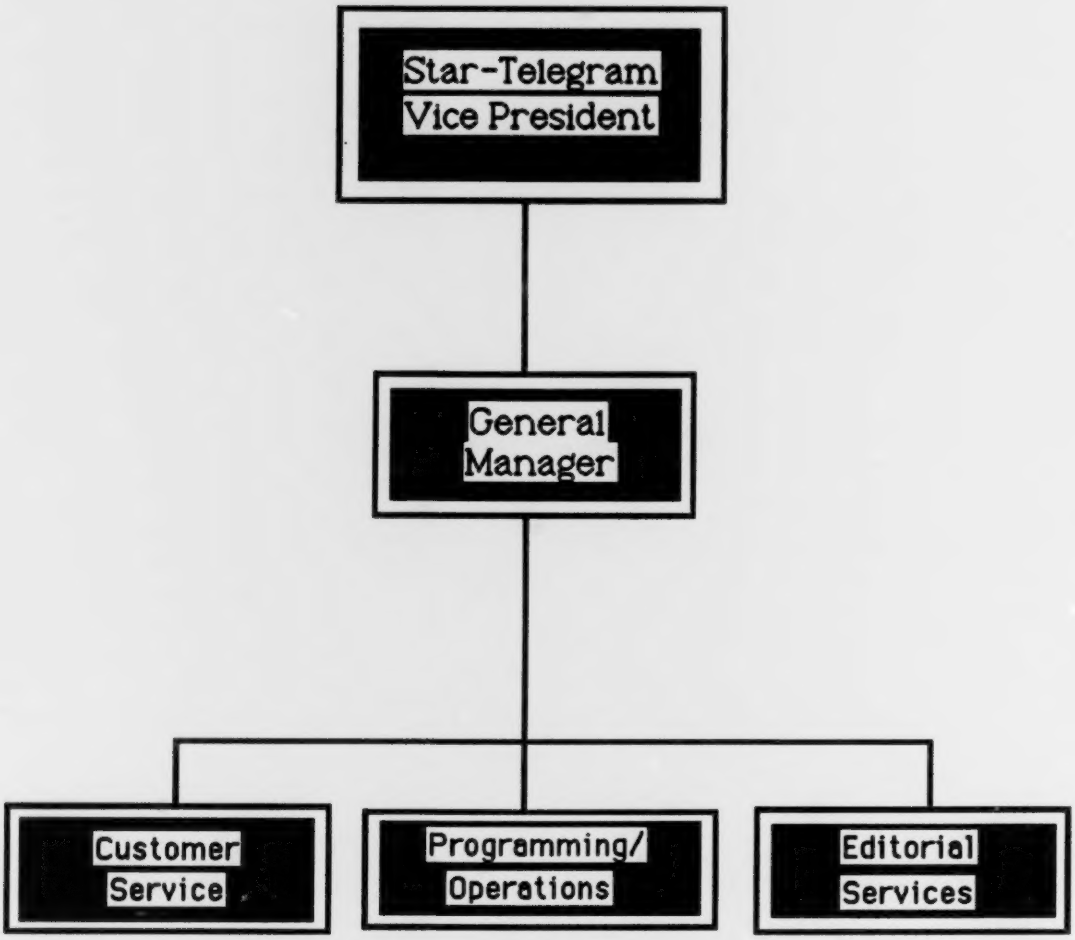
Startext news comes from two main sources: *The Star-Telegram* and the Associated Press news service. The Startext copy editor is responsible for editing stories from these two sources. Much of the editing consists of style changes and correcting minor errors, and much of that is done on the "wire" stories because the local stories already have been edited once by the newspaper's copy editors.

Counting the two system programmers, a customer service representative and three full-time copy editors, Startext employed 6.5 non-management employees (see Figure 4.2) in May 1987. Not counting the part-time copy editor, all others had worked for Startext for at least one year by September 1987 and for an average of 3.5 years by then, when Startext itself was only slightly more than five years old. The three full-time copy editors were hired directly from college journalism programs in the Southwest United States and averaged about 4.5 years at Startext.

Throughout the day, there is the ever-present mandate to keep the news current for the user because Startext is an 18-hour-per-day service boasting up-to-the-minute news, among other services. To keep the product current demands constant and continuous scanning of the wires. And since each

Figure 4.2

Organizational Chart for Startext


Star-Telegram Vice President
General Manager
Customer Service
Programming/ Operations
Editorial Services

wire service -- to facilitate story transmission -- has its own story codes, the Startext copy editor must perform "search and replace" text editing functions to find the coding, erase it, recode ("reformat") the story in Startext style, make the necessary text changes, record ("log") the story's time and place in the system for reference purposes, place ("file") the story in the Startext system and put a headline on the story. This process is repeated for each story in a specific wire and for each of the various Associated Press subject wires -- national (Washington, D.C.-based), world, state, business, sports and features.

In addition, Startext copy editors often are called upon to do other things, such as answer telephone calls from users or potential users, take messages, or monitor television for any late news items.

Two of the full-time copy editors work the day shift, beginning at 7 a.m. and 9 a.m. respectively, while the other full-timer and the part-timer start in the evening and work until 1 a.m. The news editor primarily handled customers' editorial concerns (subscriber columns, inquiries), copy edited when possible or if necessary and said the job was supervisory "basically in title only."

A typical day in the Startext newsroom found the news editor reading and dealing with subscriber complaints concerning the system the night before. Usually the problem was relayed to one of Startext's two system programmers, who examined the complaint and tracked it until the source of the problem was found, corrected and/or eliminated. By the time the news editor arrived at 9 a.m., a copy editor had already edited dozens of stories.

The two also have received a list of stories electronically from the newspaper copy editing staff, located 20 to 25 yards down the hall and working under deadlines of 8 a.m., 12:30 p.m., 10 p.m. and 12:30 a.m. Although Startext has no deadlines as such, its editorial staff has self-imposed deadlines for certain items, such as business stories and stock reports. These deadlines have largely developed from monitoring audience preferences via keyword access totals in the system.

The Startext editorial staff usually receives all local ("hard") news, sent from the city desk slot person. They also receive all local sports stories and some feature stories, although features may be revised somewhat more, depending on time constraints.

Methodology

The study's protocol framework called for an initial focus on the technology, followed by questions and observations centering on managerial, employee and environmental interaction with the technology.

Once granted access, the researcher interviewed and observed all Startext employees and managers in accordance with the previously mentioned strategies, guidelines and protocol. Employees were observed operating the technology and in their daily routines and work habitat. Interviews were scheduled at the interviewees' convenience, usually in a private office or conference room. All Startext employees except one part-time copy editor (whose late and varied schedule usually denied access) were interviewed. The majority of -- but not all -- interviews were tape-recorded to complement the researcher's notes.

Operators/Employee Users and System Impact on Work

Direct Impact

For Startext's three full-time copy editors, working at Startext seemed to present conflicts. The copy editors' stated happiness in their jobs confirmed their apparent loyalty to Startext, although each indicated a certain frustration. They appreciated videotex's journalistic advantages -- "you don't have to cram an eight-inch story in a four-inch hole" -- but voiced job concerns, such as inadequate time allowances, lack of specialization, job repetitiveness and Startext's slow growth.

However, the copy editors saw their jobs as meaningful -- mainly because of their involvement with the news, the immediate feedback from users and the potential of videotex. The latter point was a paradoxical constant throughout the case interviews.

On the one hand, videotex was a "saving grace" that each copy editor would mention to balance negative comments about the job. For example, one copy editor said videotex kept "the American dream" alive but at the same time wondered about future job preparation provided by Startext copy editing: "If I want to interview at another paper, what do I have to show for my experience here?"

In the same vein, another copy editor confessed to being "a dreamer. I feel like I could be part of something that's going to become the next television. Then I would be a pioneer." But the same person described the job as one "where you sit, basically eight hours and you do basically the same thing.... Some days it gets very boring." The remaining copy editor succinctly expressed the paradox:

> I'm not sure it's here to stay, just because our growth has been so slow. I don't think Startext is in jeopardy in general,but I don't know if it'd ever be a big industry because it just seems that there are so many more people out there with computers and modems and they aren't hooked up to Startext. I just wonder what it's going to take...I don't know, I certainly hope it survives. I think it would be great. I'd feel like one of the pioneers....I just wonder; I wonder, "If it is so great, why isn't everybody else doing it? Why isn't the Dallas paper doing it?"

Other ironies exist. The copy editors seemed pleased with their jobs and the opportunity to be at the beginning of a unique operation. They felt they were given autonomy to exercise their news judgments, to help satisfy user interests and wants, to help provide the means for others to communicate and to work on a system that eases the workload, in a sense.

For example, one copy editor said the system's electronic mail helped relay messages from users to other staffers in addition to helping journalists be "a little more perfect." To that end, mistakes that once would have been printed *by the newspaper* can now be corrected on Startext as soon as detected. In addition, because no "news hole" or space limitation per se exists, Startext can give information that the newspaper doesn't provide, such as regular computer and high technology news.

Despite those advantages, the copy editors disliked being dependent on the technology. For example, when the system is not working, no one can see the copy editor's work, nor can the copy editor work.

Indirect Impact

Copy editors also saw working for Startext with mixed emotions in terms of their relationships to other *Star-Telegram* employees. They believe many of their newspaper colleagues don't know them, or do not have a totally accurate or sympathetic picture of the operation. One non-Startext, non-writing *Star-Telegram* employee estimated that perhaps 5 to 10 percent of the newspaper's reporters use Startext. "They really think it (Startext) is almost not part of the newspaper....because there's nothing to compare it with," he said. One copy editor gave added perspective to the perceived lack of respect, however:

> There's a lot of them out there who'd rather be pounding out the copy on the typewriter instead of the VDT and I'm just the opposite. They've related the problems that they were having with their equipment to us even though we didn't have anything to do with it. There's never been any chance for reporters to come in and be given a Startext demonstration....

Managers/Supervisors and System Impact on Work

Direct and Indirect Impact

Only one manager consistently deals with Startext matters on a daily basis. As a result, it would be difficult to determine which impacts directly or indirectly affect this position. That person, the general manager, supervises all other Startext staff and reports to *The Star-Telegram* vice president of operations, a co-founder and director of Startext. The general manager has been working with Startext since its beginning, rising from a copy editor's position to general manager in a relatively short time. Unlike many newsroom middle managers (e.g., city editor or managing editor), the general manager supervises marketing, budgeting and programming as well as editorial functions.

If anyone is largely responsible for the way in which Startext employees view the system, that person would be the general manager. Employee motivation is a vital part of the job. The relative lack of employee financial/career path incentives in the Startext operation necessitates that the general manager spend considerable business and personal time communicating with the staff. For example, he schedules frequent staff meetings, as well as organizing semi-regular, non-office get-togethers with staff members.

He considers these social gatherings essential, particularly when editorial employees are compared to their counterparts in the newspaper newsroom. Their jobs are relatively unrecognized and anonymous (they receive no bylines for their work) and they are somewhat impatient with Startext's relatively slow growth.

Motivation is particularly important at times. Prolonged problems, such as those created by the software revision, quickly hurt morale. "It's very frustrating to know that what you're doing is dependent on those computers working properly. When those computers are down, so are you," said the general manager.

One common motivational tool uses the potential of the technology. The general manager often tries to help the staff "see the plateaus and stop and admire the view before we start climbing again." Frequent metaphors and analogies portray Startext as a gamble ("all of us in a sense are rolling the dice") or as a pioneering effort ("like being invited to be in on the birth of any giant technology").

The general manager also helps market Startext in varying ways. At one moment, the general manager may stuff envelopes for a subscription promotion; or set type, layout pages for and then distribute the monthly subscriber newspaper; or attend the various computer user group meetings in the Dallas-Fort Worth area; or design *Star-Telegram* "teaser" advertising for Startext; or give Startext presentations to journalists' seminars. "I probably work harder than other managers because I'm asked to do more. I have to do more for the success of Startext," the general manager said.

Of the five main functional areas of the job -- overseeing the news, programming, financial, strategic planning and public relations/marketing -- he estimated that he spent more time on the latter (35 to 40 percent) than on any other area. His estimates for the remaining areas are: news, 15 percent; programming, 20 to 25 percent; financial, 10 percent; and planning, 10 percent.

Within the news area, the general manager treats the news product according to the same journalistic guidelines followed by the newspaper: truth, accuracy and fairness, but with an eye toward exploiting the videotex capability to quickly disseminate the news. Videotex makes evaluating how well that is done easier and yet more difficult -- easier because the product is quickly displayed for all to see but difficult in the relative lack of editorial support.

In the traditional newspaper structure, copy editors and various "slot" people serve as checks and balances in regard to quality and quantity of the news. Startext differs because, in practice, those checks and balances do not consistently exist. Although this would normally be the job of the news editor, to do so -- in addition to the expected customer relations work -- the news editor would have to constantly monitor the VDT screen.

As a result, mistakes could become rather glaring. Despite the ease of identifying who made the mistake, identifying all mistakes would not be as easy because the Startext database is diverse and large. To detect all mistakes would require considerable time.

To make amends, the general manager stresses accuracy in headline writing and in editing. But such effort is inadequate, by the general manager's own admission. Consequently, the general manager -- although he routinely scans Startext, compares it to *The Star-Telegram* content and occasionally suggests story priorities -- places considerable trust in the copy editors, who he feels have earned it. "I think that it's a case of I have to trust them. If I felt like I couldn't, I would probably have to find someone else I could. I have too much responsibility for other things," he said.

In regard to strategic planning, the general manager sets aside time "as-needed" to discuss plans with his superior. Many planning ideas are developed away from the office ("in the car and in the shower") and then placed in a weekly status report to the vice president. Time is set aside with the vice president to discuss those ideas deemed worthwhile. Such time is set aside because the daily responsibilities demand most of the general manager's attention. As a result, decision-making about plans often occurs spontaneously, though the general manager sees this as an asset:

> I think that one of the secrets to our success, honestly,is that we're a small, lean, mean organization and we *can* shoot from the hip -- the ability to make quick decisions. Most of the day-to-day decisions (my superior) and I can make ourselves and I love that. I hate bureaucracy and red tape, to try to go all around to get approval for things....A lot of things we do are gut feelings. And 90 percent of the time, those turn out to be pretty much right.

Still, the effort depends on the decision. For example, the decision to offer subscribers 15-minute-delayed stock quotes ("Starquotes") service was in the making for several months. The general manager said the "gut feeling" was not apparent in this matter because of the organization's sensitivity to service pricing.

Programming is another somewhat sensitive area, primarily because of the general manager's lack of expertise in the area. This did not bother the general manager, who saw technical knowledge as something becoming less important as videotex matures and becomes "more like a TV product...At some point in time, this is going to be more of a standard product and we're going to take the technological mystique out of it."

Much of the general manager's technical expertise was gained in daily communication with Startext programmers. Such discussions often become trial-and-error brainstorming. For example, the general manager may present an idea to improve or enhance Startext services but the idea may be technically infeasible. Occasionally, the general manager will not understand the obstacles and will persist and ultimately have to rely on the programmer's word that the idea cannot be implemented. The general manager said he needs to know more technical details to be proficient in this area.

Environment and System Impact on Work

The Startext staff believes *The Star-Telegram* regular news editorial department's perception of Startext is incorrect and incomplete. Many editorial staff members probably have a general idea of Startext, but beyond that, Startext is, by and large, almost a non-entity. The physical placement of Startext offices and staff regulars help that image somewhat. Startext staffers work throughout the main newspaper building with offices on the first and second floors at opposite ends. This configuration does not help present a complete, united image.

What Startext staff members lack in geographic proximity, however, they gain in cohesion. The copy editors' office is decorated with pictures of the entire staff on various gatherings. The staff meetings are jovial, sophisticated and exhibit the skeptical team atmosphere and attitude permeating most newsroom staff meetings. This "we"-ness exists throughout, thanks largely to the motivational expertise of the general manager and his superior, the vice president of operations.

The editorial employees consider the general manager a good supervisor, primarily for his interest in them, his flexible, non-demanding demeanor, honesty, accessibility and especially his cheerleading attitude toward videotex technology. As one copy editor said:

> He's selling me on the potential of something I knew nothing about. During the times when things become frustrating....he's very good about saying, "Look what's ahead." He's very good about keeping you from getting buried in the sand and very good about keeping you looking forward.

Still, those same staff members said the general manager needed to improve his tendency to "shoot from the hip" in making decisions about them, his delegation of additional work when workloads are already full, his lack of technical expertise, the amount of his time spent on marketing and his infringement of employees' news autonomy. Each employee, however, praised the general manager for his receptiveness to discussing these problems.

The general manager also supervises programmers and a secretary. As mentioned earlier, he quite often lacked technical expertise in certain situations. On the other hand, this inadequacy often helps. When the general manager is unaware of technical limitations, his imagination has no limits and he can offer new ideas in a way difficult for technical staff members because their knowledge of such limits helps them form preconceptions about technically possibilities.

During the researcher's visit, a certain friendly-but-tense atmosphere existed between the programming and editorial staffs. As mentioned earlier, a new Startext software version implemented to accommodate new billing procedures was accompanied by access problems and "noise" (from the user standpoint) in the system. The three weeks that had lapsed apparently were frustrating for the programmers.

Asked, if given a chance, how programming could be redesigned, one programmer noted that Startext still suffered from its entrepreneurial roots. "These days I"m starting to think in terms of an organization with professional...structure and management. Something that's not so quite off-the-cuff and on-the-fly. It's getting a little big now and I wouldn't mind a little more organization to it -- a little less panic when something goes wrong, whatever structures we need to put in place to do that," the programmer said.

At the heart of the matter was the necessity to "clear the bugs" from the Startext software. It appeared that the program lacked a certain self-monitoring mechanism. A common problem scenario involved a user calling Startext offices or putting a message in the electronic mail directory to say that something in the system didn't work. "Too often that's what happens," said one staff member. "We don't have any alarms that go off. We ought to be able to find these things out somehow before they (subscribers) do."

The tension for the senior programmer seemed exacerbated by a copy editor's lack of technical knowledge. For example, subscribers often leave messages overnight concerning system technical problems. The copy editor reads these messages the following morning and relays them to the general manager and the programmers. But according to one programmer, often the copy editor tends "to put two and eight together and come up with four;" i.e, tries to "simplify" problems that technically bear only superficial resemblance.

One copy editor seemed to generate more tension than others. Part of the reason may have been this person's relatively long tenure and a personal yearning to "want to do other things," such as writing. The copy editor also grew weary of responding to user queries with the same basic answers and seemed displeased with having to do more work with no extra time to do it.

One added explanation could be that this person, in daily dealing with complaints, unconsciously assumed a somewhat negative posture -- not surprising in that the general manager often told staffers to put themselves in the subscriber's place. Still, the copy editor very much believed in videotex, in Startext's capabilities and in the general manager. Meanwhile, tension dissipated as the system began operating more efficiently.

The Star-Telegram vice president of operations, the general manager's supervisor, oversaw the entire operation. "Overseeing" aptly describes the function of this person, described by one Startext staff member as "God."

The Startext staff looks up to the vice president in various ways. A Startext founder and historian, he also helped write the original Startext software and comes from a data processing background at various newspapers. As vice president, he has the ultimate say on everything Startext does or does not do -- an option held since September 1982. He does not get involved in the daily Startext operations as a rule, however, since his job entails supervising all non-editorial and non-advertising operations for *The Star-Telegram*.

Although the vice president's hand is more visible in the long-range goals and plans of the operation, his affection for Startext runs high and the Startext staff often echoes his values:

> Employee motivation is a major factor. The fact that we're running it with the number of employees we're running it with is indicative of their commitment. If we had people who were not committed with the zeal that they are, we'd probably have 50 percent or more staff and it wouldn't run anywhere near as well as it does. The enthusiasm that you see has just been contagious. (The general manager) and I have taken this project very, very personally. We are very committed to it and that commitment is contagious. I'm not embarrassed to say that I love this project. I love this project better than anything else I've ever worked on in my life.

However, Startext still must go through the same conservative, cost-efficient standards and evaluation that all Capital Cities properties do. There is no Startext advertising budget -- what little exists comes from "as-available" space in the newspaper. The only item akin to advertising is the monthly subscriber newsletter, distributed to local computer stores.

Relationships

This study attempts to show that *the greater the relative advantage and compatibility of a technology, the less likely will the manager need to pursue motivational and controlling measures in getting subordinates to adopt the technology.* In the case of Startext, the researchers used the indices (detailed here) to determine whether the above relationship existed.

On the relative advantage, compatibility and editorial content indicator lists, an asterisk beside the number of the item indicates that a "yes" response to that item was considered to the technology's advantage. Those items without an asterisk would have necessitated a "no" response for the item to be considered to the technology's advantage. The total of such "yes" and "no" responses, then, was then divided by the total number of items to achieve the index score for each of those variables.

Although the same coding process was followed on the motivation and control lists, the index score was computed differently. For example, if a motivation item list indicated that 28 of the 32 items were favorable, instead of using the favorable answers to construct the score, the number of unfavorable responses were used to indicate the amount of motivation or control needed, in accordance with the relationships the study attempted to show.

A complete listing of the questions (and responses) for each indicator/variable appears on the following pages.

Relative Advantage Operational Indicators

*1. Is there less work than before for managers? (N)
*2. Is the technology more efficient than its predecessors? (Y)
*3. Does the technology leave the manager more time for other duties? (N)
*4. Does the technology give the manager more flexibility in his job? (N)
*5. Do the tradeoffs necessitated by the technology tend to be more positive than negative? (Y)
*6. Was the technology easy to learn? (Y)
*7. Is it easy to teach newcomers how to operate the technology? (Y)
*8. Was a trial run performed? (Y)
*9. Has the newspaper's competitive environment, on the whole, been enhanced by the technology? (Y)
*10. Has staffing been reduced because of the technology? (N)
*11. Are managers more productive because of the technology? (N)
*12. Are employees/users more productive because of the technology? (N)
*13. Is communication with the consumer enhanced by the technology? (Y)
*14. Do managers generally have a positive attitude toward the technology? (Y)
15. Do managers desire any major changes in the technology's design? (N)
16. Do managers desire any major changes in the technology's current performance? (Y)
17. Do managers desire any major changes in the technology's current method(s) of operation? (N)
*18. Are deadlines easier to attain because of the technology? (Y)
*19. Is there less work for the employee than there was before the technology? (N)
20. Was much additional training of employees required? (N)
*21. Does work flow more smoothly with the technology than without it? (Y)
22. Have intra-staff communications increased since the technology was adopted? (Y)
*23. Do editors/managers feel any sense of reward or accomplishment that did not exist before the technology? (Y)
*24. Was the previous technology (or the situation preceding adoption of the current technology) perceived as a high-risk situation? (N)
*25. Does the current technology save time? (Y)

*26. Does the current technology represent increased prestige in any capacity compared to its predecessor? (Y)
*27. Was the technology adopted because of crisis-related reasons? (N)

Compatibility Operational Indicators

1. Has the manager's job changed significantly because of the technology? (Y)
2. Has the employee/user's job changed significantly because of the technology? (Y)
*3. Does the technology completely satisfy managers? (N)
*4. Does the technology completely satisfy employees/users? (N)
*5. Does the technology make the jobs of employees/users easier than before? (N)
*6. Does the employee/user's job get completed via the technology without any unusual difficulties? (Y)
*7. Does the technology coincide with the employee/user's perception of what his job should be? (Y)
8. Does the technology change the skills that managers need in order to do their jobs? (Y)
9. Do managers yearn for the previous technology/situation? (N)
*10. Is the technology "invisible"? (N)
*11. Is the technology consistent with managers' views of "the way the paper should go"? (Y)
*12. Is there less work for the manager because of the technology? (N)
*13. Is there less work for the employee/user because of the technology? (N)
14. Have the managers' responsibilities increased because of the technology? (Y)
*15. Does the technology meet the needs of the manager? (N)
*16. Does the technology meet the needs of the employee/user? (Y)
*17. Does the technology help to normalize newsroom operations? (N)
18. Did the technology require the prior adoption of a new value system? (Y)
*19. Does the technology yield quickly observable results? (N)
*20. Does the technology enhance marketability of employee/users? (N)
21. Do employees/users perceive themselves as "deviant" from other employees because of the technology? (Y)
*22. Does the technology coincide with newsroom views on acceptable innovation? (N)
*23. Does the technology represent "the natural progression" of innovation to employees/users? (Y)
*24. Does the technology represent "the natural progression" of innovation to managers? (Y)
*25. Does the parent-corporate culture encourage adoption of the technology? (Y)
*26. Does the technology pave the way for adoption of other innovations? (Y)
27. Does the technology foster or create a new value system for its users/operators and managers (compared to the rest of the newspaper)? (Y)

Motivation Operational Indicators

1. Have any new motivation programs been initiated because of the technology's adoption? (Y)
2. Have the incentives to work changed because of the technology? (Y)
*3. Do employees have any say about the product? (N)
4. Do employees dislike their supervisors? (N)
5. Has supervisory feedback to employees been largely negative? (N)
6. Do employees believe that their supervisors are incompetent? (N)
7. Are employees unhappy in their jobs? (N)
*8. Are employees happy with the technology in general? (Y)
9. Do supervisors displease employees in the supervisors' dealings with the technology? (N)
10. Do the supervisors make employees' jobs more difficult in regard to the technology? (Y)
*11. Is the technology appealing to employees? (Y)
*12. Are employees hapy with the skill changes the technology requires? (N)
13. Do employees feel less productive with the technology? (N)

14. Do employees have more work to do with the technology? (N)
15. Do employees feel negatively different from other employees because of the technology? (Y)
16. Does the technology system often "crash"? (Y)
17. Do employees feel incompetent using the technology? (N)
18. Are overall employee relations worse since the technology was adopted? (N)
*19. Were employees consulted in the selection of the technology? (N)
*20. Was there a trial run for the technology? (Y)
21. Does the technology directly place the employee in a personnel conflict of any kind? (N)
*22. Have job descriptions or duties changed for the better because of the technology? (N)
23. Is the technology difficult to learn? (N)
24. Does the technology put any constraints on the product? (N)
25. Does the technology constrain communication with readers/consumers? (N)
26. Do employees see any problems with management's intentions concerning the technology? (Y)
27. Do only employees use the technology? (Y)
28. Does the technology induce any anxieties, stress or tensions among the employees? (Y)
29. Does the technology punish, reprimand or negatively react to employee/users' mistakes? (N)
30. Does the technology inhibit intraoffice communication? (N)
31. Does the technology inhibit employee/user creativity? (N)
32. Does the technology create any interdepartmental conflict? (N)

Control Operational Indicators

1. Do managers evaluate their staffs differently because of the technology? (Y)
2. Do managers take more time for evaluations and monitoring sincethe technology has been adopted? (N)
3. Has any re-organization occurred because of the technology? (N)
4. Has any re-staffing occurred because of the technology? (N)
5. Are technology "gurus" often consulted? (Y)
*6. Do managers often act as technology "gurus"? (Y)
*7. Do managers use the technology -- as a criteria or as a method -- in conducting employee evaluations? (Y)
8. Does the technology system often "crash"? (Y)
9. Does the technology system often have to be updated, revised or checked? (Y)
*10. Did employees/users have adequate technology training? (Y)
11. Does the technology system impair employee performance? (N)
12. Are economics a consideration in operating the technology by users? (Y)
13. Has the technology fostered any negative behavioral reactions? (Y)
14. Does management have unrealistic performance standards in evaluating the technology system? (N)
*15. Are employees/users involved in the control process concerning the technology? (Y)
*16. Is there an ultimate authority concerning the technology's operations? (Y)
*17. Does surveillance of employees get adequate managerial attention? (Y)
*18. Are there any policies or long-range plans concerning technology problems? (Y)
19. Do managers spend more time on non-production aspects of the technology rather than on production-related matters? (Y)
*20. Does the newspaper have any documentation or training manual concerning the technology? (N)
21. Does the technology's performance depend on other departments? (Y)
22. Do most employees/users distrust management's technology expertise? (Y)
*23. Does management trust employees/users in their use of the technology? (Y)
*24. Do employees have more autonomy on the job because of the technology? (N)
*25. Does management have clear, stated criteria in evaluating the technology? (Y)

26. Are control and stabilization of the technology difficult to maintain at times? (N)
27. Is the technology system frequently audited? (Y)
*28. Are there quantitative standards that employees/users must attain in operating the technology? (Y)
*29. Are there time standards that employees/users must attain in operating the technology? (Y)
30. Does any overcontrolling exist in regards to the technology? (N)
*31. Is the system's method of operation easily understood by employees/users? (Y)
32. Does the technology -- in good operational times -- encourage managerial response of any kind? (N)

Editorial Content Operational Indicators

*1. Do managers have more time to devote to the product since the technology was adopted? (N)
*2. Do managers spend more time on strategic planning of any kind since the technology was adopted? (Y)
*3. Does the technology make the manager more flexible -- provide more flexibility -- in dealing with content? (N)
*4. Does the manager's control/involvement over/with content increase with the technology? (N)
*5. Are changes in the product easier for managers to make because of the technology? (Y)
*6. Are changes in the product easier for employees/users to make because of the technology? (Y)
*7. Are deadlines more attainable because of the technology? (Y)
*8. Do managers believe the quality of writing has improved because of the technology? (N)
*9. Do employees/users believe the quality of writing has improved because of the technology? (Y)
*10. Does the technology aid the reporting process? (N)
*11. Does the technology aid the composing process? (Y)
*12. Does the technology aid in the accuracy of content? (Y)
*13. Does the technology aid in the content fairness that the organization attempts? (N)
*14. Does the technology aid in the addition of perspectives to the content? (N)
*15. Does the technology give employees/users more time for task preparation? (N)
*16. Does the technology aid the organization of content? (Y)
17. Are journalistic concerns abridged in any way by the technology? (Y)
*18. Does the technology aid in the publication of late news items? (Y)
19. Does the technology prohibit any publication of any kinds of news? (N)
20. Does the technology encourage libel risks? (Y)
*21. Are routine writing tasks facilitated by the technology? (Y)
*22. Are news (production) routines facilitated by the technology? (Y)
*23. Does the technology enhance objectivity? (N)
*24. Does the technology enhance creativity? (N)
*25. Do managers believe that content profits from the technology? (Y)
*26. Does the technology increase the information supply of the newspaper? (Y)
*27. Does the technology make adequate use of employees'/users' journalistic skills? (N)
*28. Does the technology help the newspaper to offer any content not available through other media? (Y)
*29. Does the technology permit the newspaper to go into more depth on stories than previous technologies allowed? (Y)
30. Does the technology enhance any other content more than it does the editorial content? (Y)
*31. Does the technology facilitate the use of color or informational graphics? (N)
*32. Does the technology enhance audience feedback regarding content? (Y)

The relative advantage indicator (RAI) for the Startext technology was .5925, rounded to .593 or, in terms of a percentage, 59.3%. The compatibility indicator (COMI) was 0.3333, rounded to .333

or 33.3%. The motivation indicator (MOTI) was .375 or 37.5%, the same figure for the control indicator (CONI). All figures are displayed in the bar chart, Figure 4.3.

These data indicate that videotex technology at *The Star-Telegram* has certain advantages over previous technologies and the current methods of operations at the newspaper while it presents a smaller proportion of disadvantages (or, at least, no advantages) in other areas. The technology's advantages appear in its efficiency, ease of use, the aura of prestige it lends and its acceptance by the Startext staff. On the other hand, it does not positively affect the nature of the manager's work.

It should come as no surprise, however, that videotex is not compatible with many of the pre-existing values, operations and needs of the newspaper. This probably is due to the "new" -- or at least to the "experimental" -- nature of the medium. Still, the COMI score would make one question whether videotex is "the next step" in technological advancement for newspapers, or at least in those newspapers that are not as dedicated to the technology as is *The Star-Telegram*.

Also, the MOTI score verifies what has been said about the strong motivation of Startext employees. The relative lowness (37.5%) of the score would indicate that Startext management is doing more motivational deeds correctly than incorrectly. Neither, then, should corresponding lowness (37.5%) of the CONI score be unexpected. It logically follows that an organization with relatively few motivation problems will not have to exercise control as often as one with difficulties in motivating its employees.

Still, Startext management apparently needs to refine its motivation of employees with respect to job incentives and communicating management intentions in developing the technology, especially in light of the small subscriber base. Although the current system of technology control works, room for improvement exists in terms of auditing and de-bugging the system, management devotion to production-related matters and staff autonomy in non-journalistic situations.

This study also attempts to show that that *the greater the relative advantage and compatibility, the more the newspaper's content will be perceived to have improved.* In the case of Startext, the researchers again turned to the afore-mentioned indices, particularly the editorial content index (EDCONI) score.

The Startext EDCONI score was .5312, rounded to .531, or 53.1%. While one could not consider this a "low" or "bad" score, it could be interpreted to mean that videotex is not purely a journalistic medium. Although videotex enhances some content (or at least the ability to manipulate content), management gives non-journalistic content -- i.e., non-news -- just as much (if not more) attention via the way the videotex service is offered to consumers. Perhaps videotex could be an exceptional news tool, but it is not used as such at Startext.

Theory and Summary

Several observations can be made about the Startext operation within the theoretical implications discussed earlier.

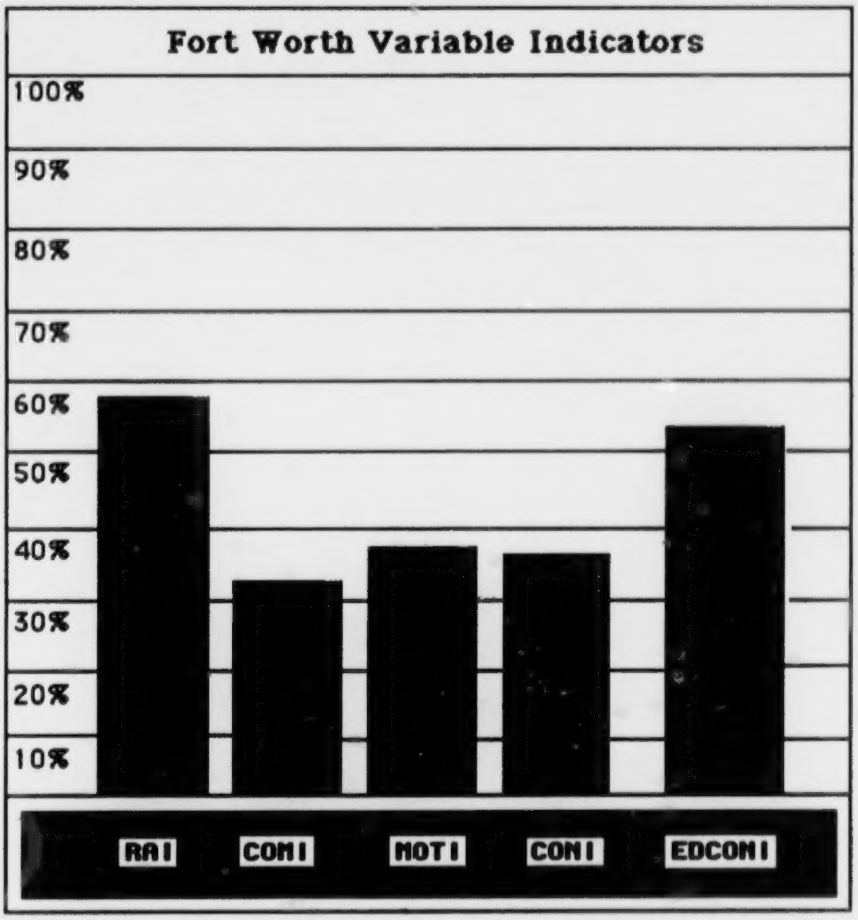
First, the technology has influenced organizational change and thus organizational behavior. Obviously, videotex necessitated some reorganization of the newspaper, i.e., the creation of the Startext operation. And the pursuant behavior -- in the copy editors and in the operation's managers -- strikingly contrasts to the behavior often found in typical newsrooms in terms of the tasks necessary to perform the job.

Second, the interaction between people -- whether they be videotex consumers or system operators -- and the technology affected organizational change. In the case of Startext, the consumer concerns, comments and complaints somewhat drive the organization in that Startext copy editors, programmers and managers are sensitive to those stimuli.

Third, management influences the rate of videotex diffusion, albeit largely indirectly via promotions, advertising and decisions on what the service will offer. Perhaps management's most direct influence is its superior motivation of Startext staff to continue to perform and offer a desirable product.

Fourth, although job task and its compatibility with the technology usually influence the technology's diffusion, videotex is not so much influenced by job task as it is by management's response to consumer concerns. The tasks of Startext copy editors remain fairly constant and have no

Figure 4.3



RAI - relative advantage index
COMI - compatibility index
MOTI - motivation index
CONI - control index
EDCONI - editorial content index

direct bearing on how many people purchase the service. Indeed, it appears that the service itself -- its offerings and content -- plays a larger part in diffusion than copy editors play.

Investigation of the videotex operation at *The Fort Worth Star-Telegram* reveals an apparently successful organization. Success is conveyed by the singular vision of purpose that employees seem to possess -- the feeling of pioneering a technology on the verge of widespread adoption. Their loyalty and faith exist despite the fact that their main motivator -- the general manager -- does not thoroughly understand the technicalities of videotex. Each staff member believes his message and feels that he is a good supervisor.

Success also may be measured in dollars and cents, in which case Startext ranks well when compared to the multi-million-dollar experiments of other newspaper chains. The operation reportedly makes a profit for the newspaper and is a model of entrepreneurship within a relatively large bureaucracy.

Success apparently carries a price, however, in job satisfaction and responsibilities of Startext employees. Although all claimed to be happy in their jobs -- professing a sense of competency in operating the technology and in performing their jobs -- certain drawbacks exist: repetitiveness and tedium, lack of professional recognition, lack of technical expertise and lack of time to pursue improvement of the product as they see fit. The latter point seems to have gotten somewhat lost amid the daily routines and other, more pressing priorities.

There also remains a great deal of anxiety among the editorial staff members as to whether Startext will continue to grow or whether it will grow at a faster rate than its present pace. Management, meanwhile, counters this worry with its "looking ahead" theme while having no stated, concrete goals for subscriber levels. One wonders how much longer the "looking ahead" approach will work. However, Startext has come farther than even some of its founders expected, given its limited resources.

CHAPTER FIVE

CASE 2: PAGINATION AT *THE BEAUMONT ENTERPRISE*

Definition of the Technology "System"

The Community

Beaumont, Texas, a city about 35 miles north of the Gulf of Mexico and about 20 miles west of Louisiana, has more than 118,000 residents. Some 375,000 people live in the metropolitan area (including Port Arthur and Orange), the growth of which was spurred by the discovery of oil at the turn of the century.[1]

Most residents' jobs usually focus on some technical, sales or mechanical task in a service or manufacturing industry,[2] although a greater percentage of residents were unemployed in 1987 than in previous years. Beaumont's unemployment rate rose from 5.8 percent in 1980 to 13.4 percent in March 1987, although the latter figure is down from the previous year.[3]

Although much of the local economy depends on petroleum for its existence, Beaumont ranked 28th among ports in the United States in total ship tonnage handled in 1986. A variety of other industries -- from shipyards to iron and brass foundries to lumber, pulp and paper mills to rice mills and food processing plants -- also operate in Beaumont.[4] But of the 16 largest employers in the area, five manufacture oil-related products and six others use petrochemicals in some form.[5]

The Beaumont-Port Arthur-Orange area is the most heavily industrialized region in Texas and was among the first areas in the state to feel the impact of the early 1980s national recession and the decline in the price of oil.[6] As part of an oil industry-wide move to boost plant efficiency and national competitiveness, since 1982 almost 50 of the region's biggest employers have eliminated more than 15,000 jobs -- a third of their total work force.[7]

As a result, the value of building permits has been nearly halved since its 1983 peak of more than $167.5 million, the number of working people in Beaumont has fallen by more than 14 percent and the metropolitan area has been surpassed by other areas in rankings of buying power, buying income and retail sales.[8]

Still, residents remain optimistic that "the bottom" has been reached.[9] A March 1987 survey showed that area consumers feel somewhat less optimistic about their current economic situation than they did in December 1986, although they reported being more optimistic about future prospects.[10]

The Newspaper

In Beaumont, there is only one daily newspaper, *The Beaumont Enterprise,* circulating to 69,569 subscribers (79,640 on Sundays)[11] and competing for news with the Orange and Port Arthur newspapers in areas where their market coverages overlap.

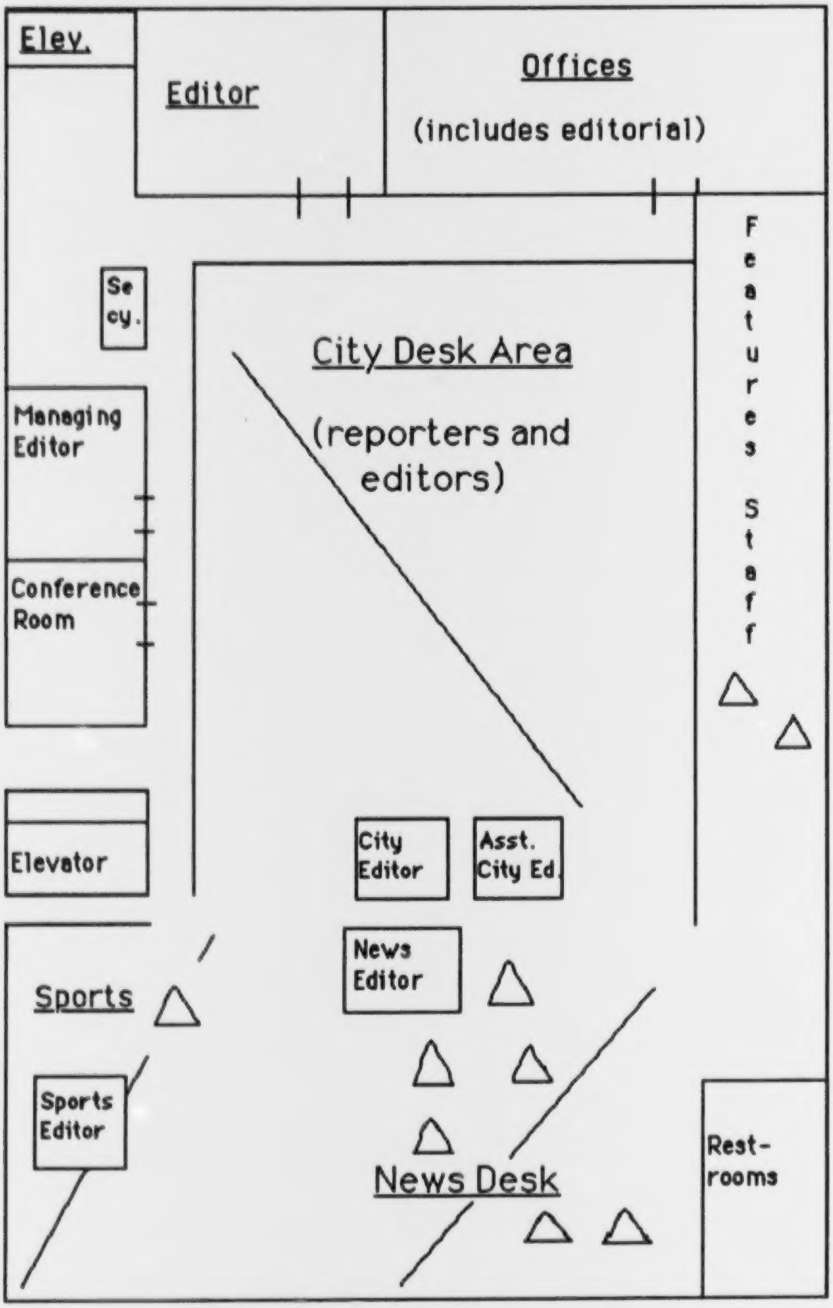
In 1984, Hearst Corp. bought *The Enterprise* from the Jefferson-Pilot Publications Group for an undisclosed price.[12] Hearst, a privately owned company, had the 12th largest media revenues of the 100 leading media companies in the United States in 1986. Some 15 newspapers accounted for $390 million of Hearst's $1.529 billion media revenues.[13]

The Enterprise typifies the daily newspaper in its newsroom operations. The newsroom consists of four primary areas: city (local, non-feature, "hard" news), features (local, lifestyle, "soft" news), sports and the news desk. Offices for the editor, managing editor and the editorial page staff surround the newsroom (see Figure 5.1).

The news department is divided according to the primary areas previously listed. Each area has a supervisor ("editor") and an assistant ("assistant editor"). The supervisor reports to the managing editor, who reports to the editor. The editor, as department chief, reports to the publisher (see organizational chart, Figure 5.2).

Figure 5.1

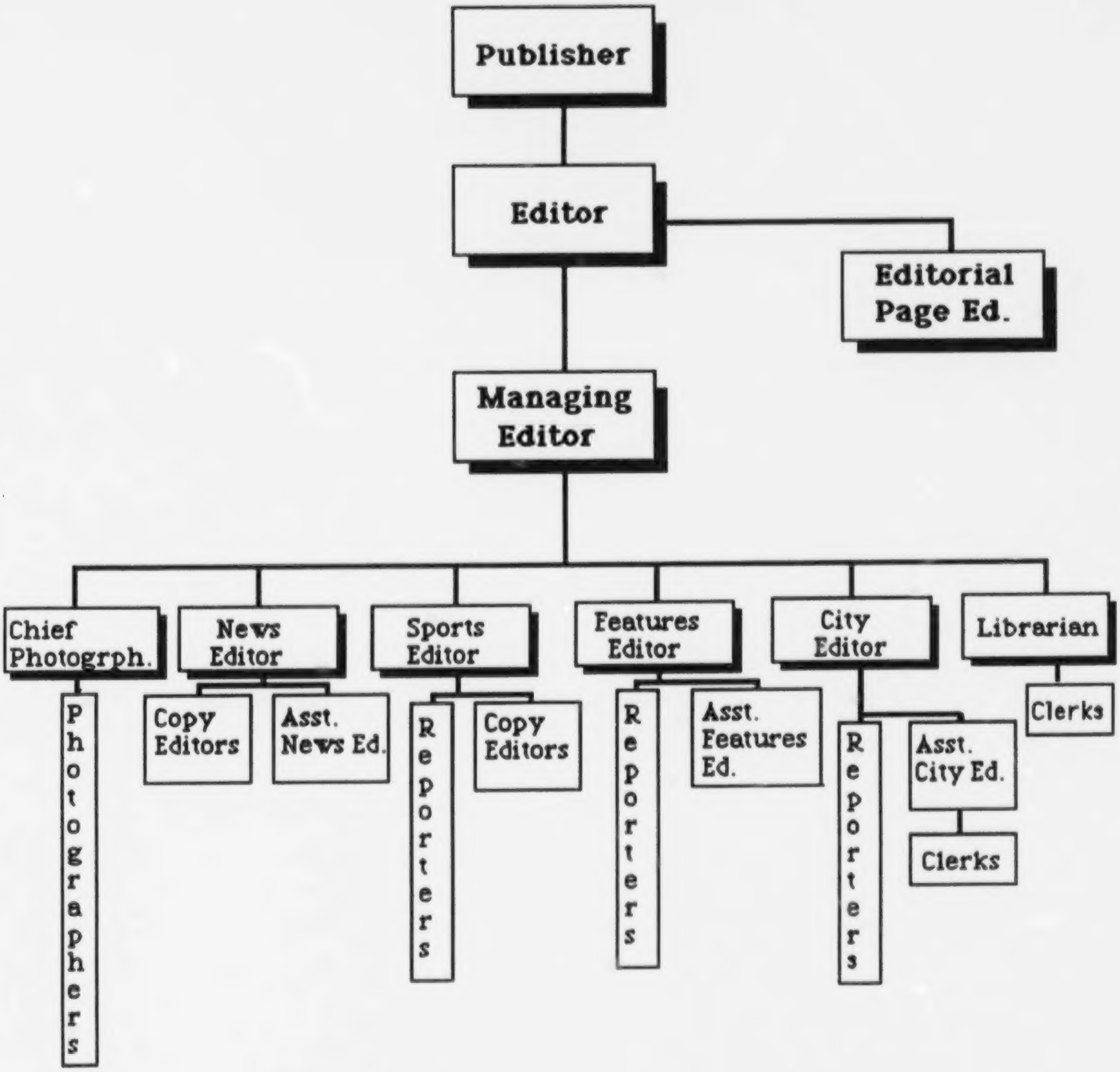
Beaumont Enterprise Newsroom Physical Layout


Elev.
Editor
Offices
(includes editorial)
Features Staff
Secy.
City Desk Area
(reporters and editors)
Managing Editor
Conference Room
Elevator
City Editor
Asst. City Ed.
News Editor
Sports
Sports Editor
News Desk
Rest-rooms

△ -- denotes page layout terminal

Figure 5.2

Organizational Chart
for The Beaumont Enterprise


Publisher
Editor
Editorial Page Ed.
Managing Editor
Chief Photogrph.
Photographers
News Editor
Copy Editors
Asst. News Ed.
Sports Editor
Reporters
Copy Editors
Features Editor
Reporters
Asst. Features Ed.
City Editor
Reporters
Asst. City Ed.
Clerks
Librarian
Clerks

History and Innovation Process

As more newspapers automate, one of the more obvious automation target areas is the composing room, the "backshop," or as many journalists call it, "the people downstairs." These workers "compose" the product, taking the text and graphics produced by the the news department and physically arranging them ("paste up") in a design dictated by editors. Technology has given newsrooms an opportunity to bypass this area via pagination -- automated page production. In the process, management realizes labor savings and the newsroom acquires more control over the final product.

Despite these advantages, relatively few newspapers -- 250 of the 1,770 daily newspapers in the United States and Canada[14] -- have adopted the technology since its debut in 1981, and few newspapers have systems integrating text and graphics. Reasons vary according to each newspaper's needs and experiences.

One primary reason has been cost. A complete system costs from $1 million to $4 million, depending on the vendor and the system's capabilities. Competition from "desktop publishing" technology, a form of pagination which many smaller newspapers adopted because of lesser costs and greater versatility, also has affected pagination acceptance.[15]

Still, some pagination users express general satisfaction with their systems, especially time-saving and manpower reduction aspects. Publishers praise these systems for providing control over the content and the page flow, enhancing deadline manipulation and design capabilities,[16] yielding better-looking pages and giving greater flexibility.[17] In contrast, editors complain of more work and responsibility and infringement on newsroom creativity,[18] necessitating redistribution of work and reorganization of staffs[19] and, ironically, requiring more manpower.[20] This same contrast and diversity of opinion characterized pagination's existence at *The Enterprise*.

Harold Martin, the publisher purchasing the pagination system, started in the newspaper business as a printer's errand boy ("devil") and developed a reputation as being one of the pioneers of industry technology. He was one of the first U.S. publishers to use optical character readers/scanners.

In 1983, *The Enterprise* underwent many changes. Martin joined Jefferson Pilot Publications in 1980-81 as president and found *The Enterprise*'s plant and morale deteriorating, making it one of the group's most troublesome acquisitions. Martin remodeled the five existing buildings and combined them into one, multi-level complex.

At the time, the newspaper used an old Digital Equipment Corp. editorial system -- in the current editor's words -- "put together by somebody who knew a lot about computers and very little about the newspaper business."[21] There were fewer editing terminals than there are pagination terminals now.

Martin changed that, thanks to Hastech, a newspaper equipment firm specializing in editorial text systems. After hearing of Hastech's system, he decided to buy it in fall 1983, with full production of graphics, text and advertising scheduled for spring 1984.

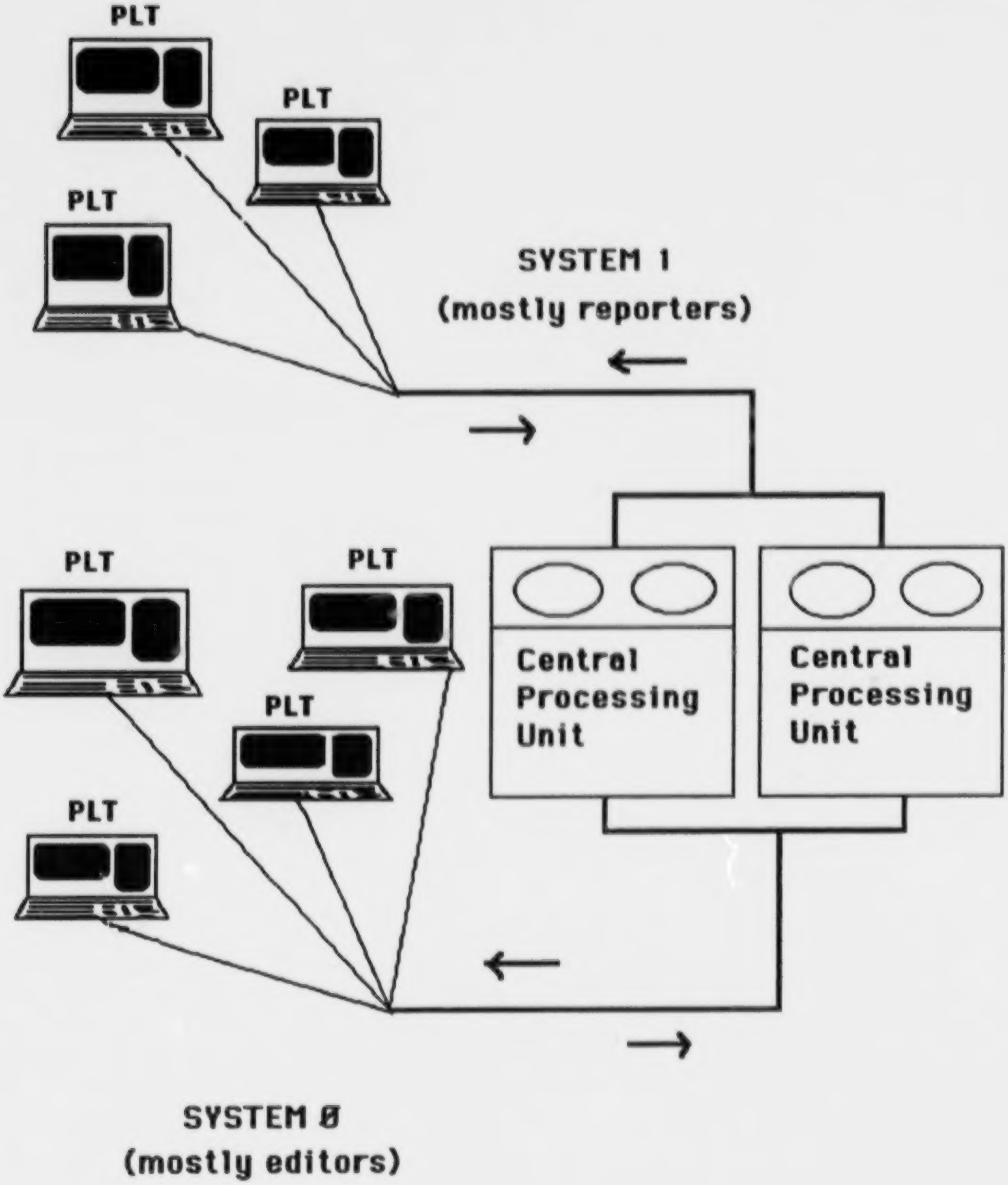
The tri-lateral phasing-in of the system included: (1) acquiring reporter and editor terminals and completing training by September 1983; (2) acquiring page layout terminals and completing training by January 1984; and (3) acquiring the "Imagiteks," the system's graphics component by spring 1984 (see system network, Figure 5.3,). The third phase, however, was not quite completed, primarily because newspaper officials discovered that the software integrating graphics-text integration was not yet fully developed.

When the Imagiteks finally came to the newsroom in 1985, the newspaper was paginating a few pages, mainly non-color section fronts carrying no advertising. The Imagiteks did little to improve matters; the quality of black-and-white photo reproduction via Imagiteks left much to be desired and integration of advertising still was unattainable. And there was little *The Enterprise* could do, according to the editor:

> Harold Martin's vision to -- as long as you're going through this horrendous remodeling process and all this disruption -- take advantage of that situation and have a computer system that was all universal(ly) compatible hardware...I guess it

Figure 5.3

Beaumont Pagination System Network


PLT
PLT
PLT
SYSTEM 1
(mostly reporters)
PLT
PLT
PLT
PLT
Central Processing Unit
Central Processing Unit
SYSTEM 0
(mostly editors)

> just wasn't in the cards because...we went back and looked over the contracts we had.

The Enterprise officials thought that the contract terms were not what they originally thought as to the vendor's responsibilities. It appeared that Martin -- because his corporate duties prevented him from dealing with contractual details -- delegated that responsibility to someone else in the Jefferson-Pilot corporation.[22]

Despite the perceived difficulties, *The Enterprise* news pagination system has been in operation since 1984. Management basically sees the system as working well with "no overwhelming sense to replace it," according to the editor.

General Operational Background

The pagination system operates within a "somewhat universal" desk concept. Theoretically, the news desk edits all copy -- in its final form -- and then assigns stories to certain pages, lays out those pages and writes headlines for the stories. In practice, however, the news desk and the sports desk share final copy editing duties, with the remaining pages -- usually advance pages for future editions -- being parceled to the features department. Most copy editing, advance or "live," resides with the 10-person news desk.

Copy is edited on a terminal with two screens: a horizontal screen displaying copy and a vertical screen simulating a layout sheet or "dummy." Editors manipulate the terminal via three keyboards that -- provided they apply the proper coding -- type, hyphenate and justify text, compose and measure headlines, and -- via a lever resembling a video game "joystick" -- design and compose pages. The keyboard functions as regular typing (text) keys and editing (page layout and graphics) keys. Six to eight groupings of keys make the same keyboard somewhat physically imposing.

The page layout keyboard group -- 42 keys -- perform some 50 functions. To create a page, the copy editor presses the SHIFT and PAGE MENU keys, creating a page slug at the top of the (horizontal) editing screen. The copy editor then fills in the page slug, which provides for 12 alphanumerics -- eight for paper and page number information and four for the date. The slug also contains the word "COMMAND," after which the copy editor types a comma, then a letter from A to E (to select the appropriate page size) and a number from 1 to 10 (to select the number of columns for the page). Then the copy editor presses the PAGE CREATE button, clearing the edit screen and displaying the page in the "open for edit" mode on the (vertical) graphics screen.

To choose a story from the item menu, the copy editor -- with the page open on the graphics screen -- presses the ITEM MENU key to see a short page selection queue (PSQ) directory of stories assigned to this page. This list appears on the edit screen. Next, the copy editor places the cursor anywhere on the story name and presses the OPEN key on the edit keyboard (the upper part of the page layout group keyboard). This opens the story on the edit screen.

Then the copy editor starts the headline placement process by placing the edit screen cursor at the story beginning and recalling the headline format (pre-stored in the PLT memory). He then types the headline text. Then he presses the LOCATE HEAD key, causing the message area on the graphics screen to prompt, "CURSOR AT HORZ. AND VERT." The copy editor then joysticks the graphics cursor to the upper-left corner of the place on the page where the headline is to be placed and presses the MARK POINT key, causing the graphics screen message area to display "HEADFIT MODE." The headline appears in place on the screen in bright letters and enclosed in an "envelope."

Once the headline has been written and placed, the copy editor closes the story on the edit screen by pressing the edit keyboard's CLOSE key (the story leaves the edit screen and its filename appears at the top left of the edit screen). The copy editor then presses the SELECT STORY key, moving the story from PSQ and making it an item in the page placement queue (i.e., the PPQ; the item name and column-depth size appear at the bottom left of the graphics screen; "SELECTED" is displayed at the top of the edit screen). Then on a clean line of the edit terminal, the copy editor writes the shaping commands (e.g., "s,3,t," to square the item across three columns and to use all of the text, respectively) and presses the FIT ITEM key. If prompted, the copy editor then places the graphics cursor at the upper-left starting position for the item and presses MARK POINT (the item will appear on the page in bright block form with the item's name and an "OVER," "UNDER," or "FIT" message within the block display.) Once the item has been properly placed on the page, the copy editor presses the COMPOSE ITEM key, causing the item to dim to half-intensity, the blocks to disappear and lines representing text to appear on the graphics screen. The name and fit status message appear on the composed item.

The vertical screen allows copy editors to size and select stories and headlines, which it then displays either as they would appear on the printed page or in magnified ("blown up") sections, depending on the copy editor's commands. The copy automatically adjusts to ("wraps around") the advertising, the parameters for which are manually placed on the "page" according to dummy sheets sent to the copy desk by the advertising department. Photos are handled similarly to advertising, in that the copy editor can only reserve space for the photo. The actual ad or photo must later be pasted onto the page. Photo cutlines, however, are handled as if they were news copy.

The system automatically gives story inch-counts, line counts ("this story is X lines over"), places as much of a story on the "page" as the copy editor desires, shows where the copy ends on the "page" and also tells the copy editor whether the copy is "loose," i.e., whether indentations, photos, the space between paragraphs or the number of paragraphs have affected its appearance in the space allotted for the story.

Methodology

As mentioned in Chapter Three, the study's protocol framework called for an initial focus on the technology, followed by questions and observations centering on managerial, employee and environmental interaction with the technology.

In the Beaumont case, once granted access, the visiting researcher interviewed and observed most *Enterprise* pagination-using employees and managers. Employees were observed operating the technology and in their daily routines and work habitat. Interviews were scheduled at the interviewees' convenience and usually in a private office or conference room.

All *Enterprise* news desk employees except two copy editors (one was on vacation, another generally was unavailable) were interviewed. The researcher also interviewed the editor, managing editor, features editor, assistant features editor, one sports copy editor and one production maintenance employee. Most -- but not all -- interviews were tape-recorded.

Employee Users and System Impact on Work

Direct Impact

Copy editing at *The Enterprise* has changed in many ways because of the page layout terminal (PLT), the generic term used by *Enterprise* copy editors to describe the vertical and horizontal screens in tandem. In general, the page layout terminal gives the copy editor more control, speeds the process of copy editing, gives more flexibility and yet these advantages demand responsibility, eye-hand coordination, quicker thinking and more planning in terms of design. These changes are reflected in various ways.

In terms of control, the copy editor no longer has to rely on the composing room to paste up copy. As one copy editor said:

> As a copy editor, one of the more frustrating things to do was to lay out a page, send a dummy down and when you went downstairs, it didn't look anything like what you had imagined it to. With the PLTs, all the responsibility lies with the person working the machine. You have a vision and you put it on the machine. And if there's any problem with it, or if something doesn't look quite right,the fault lies with the person who did it. You can't say,"Oh! The composing room messed my page up!"

Also, the realization comes that no longer will the composing room be there to help the copy editor. For example, whereas composing room personnel previously placed borders ("hairline rules") around photos, the copy editor now completes that detail via the page layout terminal. "I think that puts a lot of pressure on you," the copy editor added, "because you have to do your job and now you have to do also the composing room job."

The additional speed which PLTs provide results in readily available and accurate headline- and story-length counts as well as in the added quality of being able to see where stories or headlines will end and the ability to manipulate them to fit on the page. Previously, copy editors had to count headline lengths and estimate story lengths.

As a result, most copy editors do quicker and faster editing and designing, but not necessarily by choice, partly because of old habits and partly because of the PLTs. Although all copy editors claimed to be competent in using the terminals, not one had totally abandoned the traditional practice of using a layout sheet in designing pages. This practice was most common for section fronts (e.g., the front page, pages1B, 1C, etc.), which usually carried no advertising. The practice was least common for inside pages, which usually had at least one major advertisement.

Many copy editors use such "dummies" as guidelines but also because there is pressure to use and relinquish the PLT because of various factors addressed in detail in this chapter's environmental impact section. Suffice it to say that the time the copy editor gains in actual copy editing on the PLT is offset by the time needed to plan and design pages prior to gaining access to the PLT.

This general "tradeoff" or contrast does not appear, however, in copy editing staff attitudes and emotions in the assessment of job impact. For example, most copy editors felt that PLTs made copy editing more meaningful or saw themselves happier with or more motivated in the job, usually via the increased control over -- and thus potentially enhanced pride in -- the product. Some of the positives included increased enthusiasm for the job and enhanced creativity.

Indirect Impact

Still, there was no shortage of frustration in dealing with PLTs. The machines required more work in designing pages (because of the use of "dummies"), were in short supply, often did not work ("the system crashed") and created problems with composing room personnel. In addition, the PLT's vertical component (the "page" screen) was not as efficient in some ways as the horizontal component.

The latter issue seemed to be a software shortcoming of the system. For example, if a copy editor deletes an item from the horizontal screen (staff members often call it "the magician,"), and/or if the copy editor wishes to retrieve the story, he can do so. If the story is on the page screen and is deleted, the story cannot be retrieved. Still another shortcoming involves the visual limitations of the page screen, the construction of which assumes that all pages are "broadsheets," thus eliminating any tabloid-style designs.

Copy editors' comments and work practices also revealed certain patterns. Those copy editors most pleased with PLTs tended to have several years' experience in journalism, or to have relatively few years' experience, or to be relatively new at *The Enterprise* . They were satisfied with the technology, although that satisfaction was "neutral," i.e., an acceptance of the PLTs' hardware and software limitations. For example, more experienced copy editors usually remembered copy editing "in the old days" and, in comparing, easily saw PLTs' advantages. Younger copy editors were enthusiastic about the opportunities to impress provided by the PLTs. Newer staff members often came from smaller newspapers and were grateful to come to a newspaper with the latest editing technology.

The PLTs' positive reputation, however, is surprising in light of the PLT training given the copy editing staff. The system was phased in over a three-week period, beginning with the lifestyle section, followed by the news desk, each editing advance pages. Then came deadline editing by the sports department, followed by everyone editing "live." Complaints ranged from lack of consistency in training methods and subject matter, to not enough time, to dissatisfaction with general teaching methods, to lack of training and support from the hardware vendors. One copy editor summed up feelings in this area:

> It would have been easier if it had been more of a gradual change. It was very much (as if) we felt a heavy hand hanging over us saying, "You *will* make this immediate conversion" -- like flipping a light switch: One day you're doing it this way and the next day you're doing it *this* way. People tend to resist the change and the

> technology so much that if you don't have somebody behind you, pushing you every step, it's not going to get done. So they just pushed us off the cliff all at once.

Such comments seem to have been motivated by a desire to produce a high-quality product. This desire appeared strong and pervasive among *Enterprise* copy editors and was reflected in their suggestions for improvements. Although these improvements included desires to integrate art and text ("something more exotic than ragged right") or to improve general editing capabilities, most suggestions dealt not with the PLTs as editing terminals but with the PLTs' perceived tendency to "crash." Once again, the advantages of the system were countered by the disadvantages of the working environment the system created.

Managers/Supervisors and System Impact on Work

Direct Impact

The Enterprise page layout system uniquely affected three middle managers -- the news editor, the assistant news editor and the features editor. Not only did all three supervise employees who use the PLTs, all three also used the PLTs a great deal. In essence, they have two perspectives on the PLT: that of user and supervisor of user. But the nature of these middle managers' jobs apparently caused their attitudes toward the PLT to differ markedly.

For example, although all three agreed that the PLTs have changed their jobs in giving them more and final responsibility for the pages produced, they did not agree in labeling that an advantage. The news editor did not agree because being more attuned to production -- whether the typesetters work properly, whether news pages went through the system properly, locating and correcting problems -- took away from editorial concerns.

Part of this worry may come from the responsibility put on the news desk by its role in the news flow system. As a universal copy desk, the news desk ultimately edits all copy except sports. A news editor may view this responsibility positively or negatively, depending on workload, past experiences, efficiency of the technology, career goals, personal expectations, quality and quantity of co-workers and management expectations. In the case of *The Enterprise* news editor, all may have played a part in his reaction.

For example, the news editor came to *The Enterprise* from a larger-circulation newspaper known for technological advancement and internal organizational efficiency. The news editor also approached his work on the previous system from a journalistic standpoint. With only eight PLTs for almost double that number of users, the technology's efficiency was hampered. These two factors could tend to make the news editor somewhat pessimistic in this regard. But then, he could also be classified as realistically seeing the advantages and disadvantages:

> (PLTs) have given copy editors more control over the final editorial product to a degree because you're actually building a page on the floor of the newsroom and not on the floor of the composing room. However, the system is sold saying, "Well, everything is controlled electronically." For instance, in spacing, the machine will automatically put the correct amount of space between the bottom of a headline and where the story starts underneath it. It's programmable, it can be changed. And while that's true, in actual practice, we were probably getting better spacing done in lots of ways by printers...simply because the system doesn't always operate the way it's supposed to and we have to override the "setups," as they're called -- all the spacing, sizes and everything that are built into the system. We can go in and change them, but they just don't always work and you have to go in and override those to make it work.

In contrast, the assistant news editor, while aware of the system's faults, had a more positive view of the system. He felt more productive and motivated to reach his potential. "I don't know if it has made me better or any worse, but it has made the job a lot more enjoyable," he said.

The features editor, on the other hand, fell somewhere between the assistant news editor and the news editor in terms of attitude toward the system. Although work seemed more meaningful ("because when you've had a page that looks wonderful, you've done it all yourself") and there was a sense of being more productive, the features editor felt tradeoffs were involved: less time to deal with other aspects of the job and the less-than-perfect way the product is designed.

Indirect Impact

The PLTs enhanced the managerial jobs of the features editor, the news editor and assistant news editor in two ways. First, the PLTs proved more-than-adequate motivators and recruiting tools. For example, *The Enterprise* attracts some newer employees because they have an opportunity to work with new technology unavailable elsewhere.

Second, PLTs help convey management expectations for performance. With a PLT, a copy editor's growth or regression in the job is easily observable. Management can tell whether the copy editor is grasping the concepts and whether he is laying out the page exactly the way it should be done, exhibiting some comfort with the machines' operations and demonstrating ability to get beyond the system basics.

However, PLTs do not have quite such a positive impact in other management functions. In planning, the PLTs' limitations and strengths play a key factor in planning page production. For example, PLTs enable the assistant news editor to more adequately plan election-night returns, organizing and printing them in a much more efficient and time-saving manner. But PLTs also can hinder planning, according to the features editor:

> Prior to pagination, you would edit up the copy, send it to the composing room downstairs, the composing room would strip it in. That would free you for a three- or four-hour period of time for you to talk to your reporters, do all the kinds of communication you do with the desk, edit copy, read wire. And then you'd go down and check pages. *This* way, you're committed to sitting at that tube for three or four or five hours and if the system goes down it may be seven or eight hours getting out an eight-page section, or 10- or 12-page section. And I think that's why I'm having problems on the tube right now; because at the same time I'm sitting down doing that, I'm also having to answer questions from reporters, check on art, do graphics. It's a steady stream of activity.

Another PLT management effect resides in organizing and staffing the news desk. As noted earlier, the relative shortage of non-sports terminals created a perceived pressure problem for copy editors. To resolve the shortage, the news desk reorganized. Previously, most copy editors arrived at work between 3 p.m. and 4 p.m. It soon became obvious, in adding PLTs, that schedules would have to be shifted to control copy flow and PLT use. As the assistant news editor said, "It has made us more aware of the workload in that we can't all get here at one time and just shove stuff out. We have to put some thought, some work into making things work in the system."

During the researcher's visit, the news desk still was in the process of getting copy editors to come in earlier, to produce pages so that anything that could be done in advance was so done, thus freeing terminals for live news pages. This had been accomplished to a certain extent.

In addition, PLTs created more work and forced managers and subordinates to make difficult choices. For example, glaring content or design mistakes occurring on deadline force the news desk person-in-charge to decide whether the page should be redone. Most often, the error -- if relatively insignificant -- is published, especially if it's on a first-edition page. Then it is corrected for the second edition. The fact that it costs anywhere (depending on the source) from 90 cents to $1.10 per page to send a completed page to the typesetter compounds the decision. "I would say there's a tendency -- it doesn't happen very much -- but there's a tendency to get caught up in a time crunch and let things slide that we don't want to let slide," the assistant news editor said.

Environment and System Impact on Work

The Enterprise PLTs have had a strong-though-somewhat-indirect effect on newsroom atmosphere in several areas. The most visible impact has been in geographic and physical arrangements. The newsroom consists of four main areas: city (local, non-feature news), features (local, lifestyle-type news), sports and the news desk. Most PLTs are in the news desk area, with the remainder split between sports and features (each with two or three PLTs). Ten news, three sports and two features staffers use PLTs. The obvious shortage of PLTs requires some personnel to travel across the newsroom to use a PLT and, once there, finish their tasks as soon as possible.

This has three effects. First, some copy editors feel "rushed." In the past, staffers commonly stood around waiting to use PLTs. This encouraged the user to "come prepared," probably using a dummy sheet to sketch a rough draft of the page. This, in turn, necessitated some prior story editing, headline writing and photo sizing. But part of this preparation often was repeated once the copy editor gained access to a PLT. Therefore, some time was lost and pages took longer to design and edit.

Second, because the copy editor is hurried, content may not have received the examination that it would previously have received. "If the page isn't working, that adds the pressure to you because you tend to make more mistakes when you know that somebody's standing right there needing the machine just as much as you do," said the features editor.

Third, the PLT shortage created a social problem for the features desk copy editors, jokingly called "the nomads." They often must leave their department to use a PLT. Depending on their task, they will be relatively out of communication with their departmental colleagues. Similarly, when a news desk copy editor must leave the news desk area at night to use a PLT, chances are that the PLT will be in the features department on the opposite side of the newsroom -- thus putting that person in relative isolation since the features area is usually vacant at night. This may change with the proposed establishment of staggered news desk working hours that was to occur soon after the researcher's visit.

Another indirect impact resulted from PLTs' perceived inefficiency as a system. One of the most common complaints was the system's tendency to "crash." Although this did not occur frequently (during the author's visit there was just one such incident), the system has been "down" for as long as four hours at times. As the managing editor said, "That's not the thing you forget quickly...When that system crashes like that, we have control of nothing."

Copy editors usually attributed such "crashes" to the system's networking -- two systems (system 1 and system 0), one for writing and one for editing -- supposedly so designed because of building electrical wiring limitations. This also becomes a departmental problem because the wiring differs in some newsroom departments. The "crash" is perceived to occur when someone attempts "cross-networking" in the editing of a story. Not only does a "crash" mean staff members cannot do their work; they always have an extra, added worry, as told by the assistant news editor:

> (When there's a crash,) if you've got a page open (i.e., working on the page), sometimes that page can be corrupted. When the system comes back up, if you try to send it (the page) through the typesetter, it'll knock out the whole system again and there's no way to know whether it is (corrupted) or not. That's the biggest factor: We really don't trust the system.

Working in this untrustful atmosphere, however, is not a constant fear at *The Enterprise*. Still, apprehension and anxiety exist and trust in management on this point did not run high, for several reasons. First, copy editors felt they should have been consulted prior to purchase of a technology on which they are the primary operators. Second, the manner in which training and phasing-in of the system were accomplished left doubt in some copy editors' minds as to management's attention to employee concerns. Third, the performance of the PLT system (including the Imagiteks) had not fostered much trust in management's judgment. Fourth, copy editors' relationships with the composing room personnel and production maintenance were not ideal in many cases.

On this latter point, some copy editors experienced some resentment from some composing room employees, especially during problems or difficulties with pages. Some copy editors said they have been told, in essence, "you have the machines up there, *you* fix it" when they have asked for help with pages. One copy editor also felt that the leading computer maintenance man did not seriously consider the newsroom's PLT problems.

"There are many times when you call him -- it's one of those (situations in which) you've done it 300 times and on the 301st it won't work -- and he will tell you, 'You must have done something wrong' and maybe we did. But it's like nine times out of 10 it's something *you* (the PLT operator) did wrong," the copy editor said. The maintenance man, however, saw in such reaction a reluctance to accept the responsibility that comes with control. He said the problem results from a difference in view: editorial is concerned about content whereas he is concerned with the entire production process.

Surprisingly, this trust did not seem to affect management-employee interactions. Each middle manager drew generally positive comments from subordinates. There was general respect for each manager among copy editors and criticism usually was tempered with realization that the manager was doing his best. The managers felt little had changed in relationships with staffs and saw the situation as generally positive.

This atmosphere of apprehension, mistrust and yet mutual respect among copy editors and middle managers was set amid the editor's recognition of the PLT shortage and yet his belief that not enough of a problem existed to justify buying additional PLTs at $3,500 to $4,000 per PLT. He and the managing editor also saw the PLT system as basically good, although neither ever used a PLT.

The Enterprise upper management's general attitude toward the PLT system could be classified as "wait-and-see," as refinements such as the news desk reorganization/rescheduling, increased newsroom-composing room communication and a developing total "team effort" concept evolved. Much of this attitude specifically stemmed from concern about the area and Texas economy, although the economic situation had not affected *The Enterprise*'s competitive situation nor had it endangered any employee jobs.

In the context stated thus far, however, there were some mixed feelings on *The Enterprise* staff about the newspaper's content quality, especially where it indirectly concerned the PLTs. At the time, the newspaper had revamped its first inside page (2A) to highlight and summarize the paper's contents as a concession to readers' changing reading habits. Although well-received, the project had been inconsistently executed; e.g., news stories summarized on 2A often were not detailed elsewhere as intended or summaries often were longer than the story.

But the editor saw such errors stemming in part from staff members not taking full advantage of the PLTs:

> It's obvious when I go over the paper....we don't take full advantage of that editing ability that we could very easily (do). I think because of the old days in the paper newsroom, you had to take the wire as it was, I think some of us have made the transition that "Because it comes over the wire, I have to take it as it is." Well, you don't. You're sitting here with this keyboard that will let you do anything you want to do with that copy to make it better and we don't do it sometimes.

Copy editors and their managers shared other concerns about PLT-affected content. If the news editor is more attuned to production matters than any other aspect of his job, then that naturally takes away time formerly devoted to journalistic matters and eventually from content quality. The burden of copy editing local stories, then, falls on the city desk, although this "burden" has always been assumed by the city editor and the assistant city editor. The only difference is that the news desk *relied* on that assumption more than in the past.

Some copy editors felt that PLT-increased time to design a page meant less time for copy editing. "My first duty is no longer to read copy well," said one copy editor. "It's to put that copy on the page by deadline, and still we're expected to do both."

Local news becomes affected -- albeit rarely -- when a late-developing news story comes to editors' attentions. Because of the time it takes to change a PLT-constructed page -- in addition to deadline constraints and other production limitations -- the city editor may feel that the story "complicates" the news desk's layout plans, at least for the more visible pages in the newspaper. It also might be easier to put the story on a page in-process rather than on a completed page. The absence of competition also encourages such a decision. Although this is an infrequent situation, this tendency may deter producing a "quality newspaper."

Many copy editors believe, however, that PLTs have improved content because they provide flexibility in manipulating and packaging stories, headlines and photos. But still another (non-sports) copy editor said that wire stories are more likely to be included if they are shorter because the PLTs take more time to edit longer stories, thus ruling out longer, more in-depth articles and favoring wire services that consistently produce shorter, more concisely written stories.

Relationships

This study attempts to show that *the greater the relative advantage and compatibility of a technology, the less likely will the manager need to pursue motivational and controlling measures in getting subordinates to adopt the technology.* To determine whether this hypothesis held in the Beaumont case, the researchers used the indicator indices mentioned in Chapter Three.

On the relative advantage, compatibility and editorial content indicator lists, an asterisk beside the number of the item indicates that a "yes" response to that item was considered to the technology's advantage in that situation. Those items without an asterisk would have necessitated a "no" response for the item to be considered to the technology's advantage. The total of such "yes" and "no" responses, then, was then divided by the total number of items to achieve the index score for each of those variables.

Although the same coding process was followed on the motivation and control lists, the index score was computed differently. For example, if a motivation item list indicated that 28 of the 32 items were favorable, instead of using the favorable answers to construct the score, the number of unfavorable responses were used to indicate the amount of motivation or control needed, in accordance with the relationships the study attempts to show.

A complete listing of the questions (and responses) for each indicator/variable appears below.

Relative Advantage Operational Indicators

*1. Is there less work than before for managers? (N)
*2. Is the technology more efficient than its predecessors? (N)
*3. Does the technology leave the manager more time for other duties? (N)
*4. Does the technology give the manager more flexibility in his job? (N)
*5. Do the tradeoffs necessitated by the technology tend to be more positive than negative? (N)
*6. Was the technology easy to learn? (Y)
*7. Is it easy to teach newcomers how to operate the technology? (Y)
*8. Was a trial run performed? (Y)
*9. Has the newspaper's competitive environment, on the whole, been enhanced by the technology? (N)
*10. Has staffing been reduced because of the technology? (N)
*11. Are managers more productive because of the technology? (N)
*12. Are employees/users more productive because of the technology? (N)
*13. Is communication with the consumer enhanced by the technology? (N)
*14. Do managers generalyl have a positive attitude toward the technology? (N)
15. Do managers desire any major changes in the technology's design? (Y)
16. Do managers desire any major changes in the technology's current performance? (Y)
17. Do managers desire any major changes in the technology's current method(s) of operation? (Y)
*18. Are deadlines easier to attain via the technology? (N)
*19. Is there less work for the employee than there was before the technology? (N)
20. Was much additional training of employees required? (N)
*21. Does work flow more smoothly with the technology than without it? (N)
22. Have intra-staff communications increased since the technology was adopted? (N)
*23. Do editors/managers feel any sense of reward or accomplishment that did not exist before the technology? (N)
*24. Was the previous technology (or the situation preceding adoption of the current teachnology) perceived as a high-risk situation? (N)
*25. Does the current technology save time? (N)

*26. Does the current technology represent increased prestige in any capacity compared to its predecessor? (Y)
*27. Was the technology adopted because of crisis-related reasons? (N)

Compatibility Operational Indicators

1. Has the manager's job changed significantly because of the technology? (Y)
2. Has the employee/user's job changed significantly because of the technology? (Y)
*3. Does the technology completely satisfy mangers?
*4. Does the technology completely satisfy employees/users? (N)
*5. Does the technology make the jobs of employees/users easier than before? (N)
*6. Does the employee/user's job get completed via the technology without any unusual difficulties?
*7. Does the technology coincide with the employee/user's perception of what his job should be? (N)
8. Does the technology change the skills that managers need in order to do their jobs? (Y)
9. Do managers yearn for the previous technology/situation? (N)
*10. Is the technology "invisible"? (N)
*11. Is the technology consistent with managers' views of "the way the paper should go"? (Y)
*12. Is there less work for the manager because of the technology? (N)
*13. Is there less work for the employee/user because of the technology? (N)
14. Have the managers' responsibilities increased because of the technology? (Y)
*15. Does the technology meet the needs of the manager? (N)
*16. Does the technology meet the needs of the employee/user? (Y)
*17. Does the technology help to normalize newsroom operations? (N)
18. Did the technology require the prior adoption of a new value system? (Y)
*19. Does the technology yield quickly observable results? (Y)
*20. Does the technology enhance marketability of employee/users? (Y)
21. Do employees/users perceive themselves as "deviant" from other employees because of the technology? (N)
*22. Does the technology coincide with newsroom views on acceptable innovation? (Y)
*23. Does the technology represent "the natural progression" of innovation to employees/users? (Y)
*24. Does the technology represent "the natural progression" of innovation to managers? (Y)
*25. Does the parent-corporate culture encourage adoption of the technology? (Y)
*26. Does the technology pave the way for adoption of other innovations? (N)
27. Does the technology foster or create a new value system for its users/operators and managers (compared to the rest of the newspaper)? (Y)

Motivation Operational Indicators

1. Have any new motivation programs been initiated because of the technology's adoption? (N)
2. Have the incentives to work changed because of the technology? (Y)
*3. Do employees have any say about the product? (Y)
4. Do employees dislike their supervisors? (N)
5. Has supervisory feedback to employees been largely negative? (N)
6. Do employees believe that supervisors are incompetent? (N)
7. Are employees unhappy in their jobs? (N)
*8. Are employees happy with the technology in general? (N)
9. Do supervisors displease employees in the supervisors' dealings with the technology? (N)
10. Do the supervisors make employees' jobs more difficult in regard to the technology? (N)
*11. Is the technology appealing to employees? (Y)
*12. Are employees hapy with the skill changes the technology requires? (Y)
13. Do employees feel less productive with the technology? (N)

14. Do employees have more work to do with the technology? (Y)
15. Do employees feel negatively different from other employees because of the technology? (N)
16. Does the technology system often "crash"? (Y)
17. Do employees feel incompetent using the technology? (N)
18. Are overall employee relations worse since the technology was adopted? (N)
*19. Were employees consulted in the selection of the technology? (N)
*20. Was there a trial run for the technology? (Y)
21. Does the technology directly place the employee in a personnel conflict of any kind? (N)
*22. Have job descriptions or duties changed for the better because of the technology? (N)
23. Is the technology difficult to learn? (N)
24. Does the technology put any constraints on the product? (Y)
25. Does the technology constrain communication with readers/consumers? (N)
26. Do employees see any problems with management's intentions concerning the technology? (Y)
27. Do only employees use the technology? (N)
28. Does the technology induce any anxieties, stress or tensions among the employees? (Y)
29. Does the technology punish, reprimand or negatively react to employee/users' mistakes? (Y)
30. Does the technology inhibit intraoffice communication? (N)
31. Does the technology inhibit employee/user creativity? (Y)
32. Does the technology create interdepartmental conflict? (N)

Control Operational Indicators

1. Do managers evaluate their staffs differently because of the technology? (Y)
2. Do managers take more time for evaluations and monitoring since the technology has been adopted? (N)
3. Has any re-organization occurred because of the technology? (Y)
4. Has any re-staffing occurred because of the technology? (Y)
5. Are technology "gurus" often consulted? (Y)
*6. Do managers often act as technology "gurus"? (Y)
*7. Do managers use the technology -- as a criteria or as a method -- in conducting employee evaluations? (Y)
8. Does the technology system often "crash"? (Y)
9. Does the technology system often have to be updated, revised or checked? (Y)
*10. Did employees/users have adequate technology training? (Y)
11. Does the technology system impair employee performance? (Y)
12. Are economics a consideration in operating the technology by users? (Y)
13. Has the technology fostered any negative behavioral reactions? (N)
14. Does management have unrealistic performance standards in evaluating the technology system? (N)
*15. Are employees/users involved in the control process concerning the technology? (Y)
*16. Is there an ultimate authority concerning the technology's operations? (Y)
*17. Does surveillance of employees get adequate managerial attention? (Y)
*18. Are there any policies or long-range plans concerning technology problems? (N)
19. Do managers spend more time on non-production aspects of the technology rather than on production-related matters? (N)
*20. Does the newspaper have any documentation or training manual concerning the technology? (Y)
21. Does the technology's performance depend on other departments? (N)
22. Do most employees/users distrust management's technology expertise? (Y)
*23. Does management trust employees/users in their use of the technology? (Y)
*24. Do employees have more autonomy on the job because of the technology? (Y)
*25. Does management have clear, stated criteria in evaluating the technology? (Y)

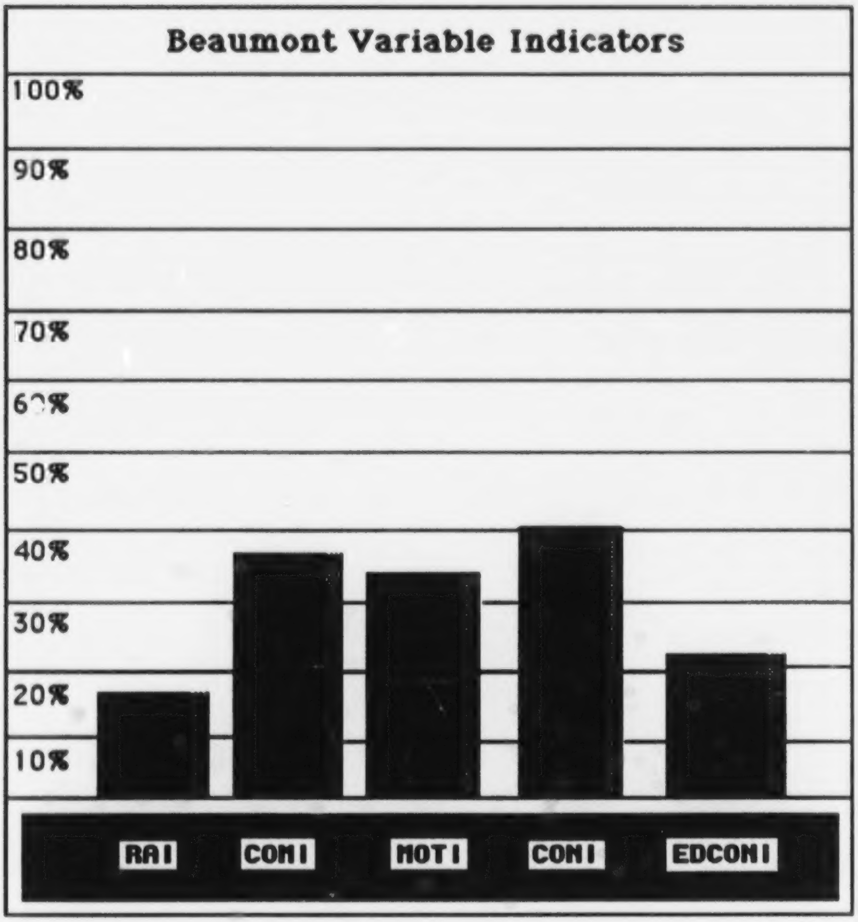
26. Are control and stabilization of the technology difficult to maintain at times? (Y)
27. Is the technology system frequently audited? (Y)
*28. Are there quantitative standards that employees/users must attain in operating the technology? (Y)
*29. Are there time standards that employees/users must attain in operating the technology? (Y)
30. Does any overcontrolling exist in regards to the technology? (N)
*31. Is the system's method of operation easily understood by employees/users? (N)
32. Does the technology -- in good operational times -- encourage managerial response of any kind? (N)

Editorial Content Operational Indicators

*1. Do managers have more time to devote to the product since the technology was adopted? (N)
*2. Do managers spend more time on strategic planning of any kind since the technology was adopted? (N)
*3. Does the technology make the manager more flexible -- provide more flexibility -- in dealing with content? (N)
*4. Does the manager's control/involvement over/with content increase with the technology? (Y)
*5. Are changes in the product easier for managers to make because of the technology? (N)
*6. Are changes in the product easier for employees/users to make because of the technology? (N)
*7. Are deadlines more attainable because of the technology?(N)
*8. Do managers believe the quality of writing has improved because of the technology? (N)
*9. Do employees/users believe the quality of writing has improved because of the technology? (N)
*10. Does the technology aid the reporting process? (N)
*11. Does the technology aid the composing process? (Y)
*12. Does the technology aid in the accuracy of content? (N)
*13. Does the technology aid in the content fairness that the organization attempts? (N)
*14. Does the technology aid in the addition of perspectives to the content? (N)
*15. Does the technology give employees/users more time for task preparation? (N)
*16. Does the technology aid the organization of content? (Y)
17. Are journalistic concerns abridged in any way by the technology? (Y)
*18. Does the technology aid in the publication of late news items? (N)
19. Does the technology prohibit any publication of any kinds of news? (N)
20. Does the technology encourage libel risks? (N)
*21. Are routine writing tasks facilitated by the technology? (N)
*22. Are news (production) routines facilitated by the technology? (N)
*23. Does the technology enhance objectivity? (N)
*24. Does the technology enhance creativity? (N)
*25. Do managers believe that content profits from the technology? (N)
*26. Does the technology increase the information supply of the newspaper? (N)
*27. Does the technology make adequate use of employees'/users' journalistic skills? (N)
*28. Does the technology help the newspaper to offer any content not available through other media? (N)
*29. Does the technology permit the newspaper to go into more depth on stories than previous technologies allowed? (N)
30. Does the technology enhance any other content more than it does the editorial content? (N)
*31. Does the technology facilitate the use of color or informational graphics? (Y)
*32. Does the technology enhance audience feedback regarding content? (N)

The scores were as follows: RAI, 18.5%; COMI, 37.0%; MOTI, 34.4%; and CONI, 40.6% (all scores are displayed in Figure 5.4). The newspaper's PLT system has relatively few advantages when

Figure 5.4



RAI - relative advantage index
COMI - compatibility index
MOTI - motivation index
CONI - control index
EDCONI - editorial content index

compared to the previous system. Obviously, the PLTs did not work as well as management had hoped for reasons already stated. In terms of technological efficiency, the amount of work PLTs create and the system's operative problems, one would be hard-pressed to find any relative advantage presented by PLTs in Beaumont.

The compatibility of the pagination system with *Enterprise* management and staffers expectations was relatively low, as shown by the index. A 37% score tends to reflect more incompatibility than the management had intended. Although pagination is seen as a potentially useful tool, reality and expectations have not coincided in terms of user and manager satisfaction and perceptions.

As a result, the motivation score is surprising. One would think that it would be higher than the 34.4.% -- i.e., that more motivation would be needed -- given the apparent dissatisfaction and disappointment that pagination has created. Perhaps this is because PLT users have experienced and appreciate the potential benefits of pagination and that, being professionals, they have accepted its disappointments and problems in hopes that management eventually will improve matters. Or it simply could be that management has done its job and that the technology has not.

The same could be said, to a lesser degree, of the control area, the indicator for which yielded a 40.6% score. The low compatibility and relative advantage scores would lead one to expect problems in system control. Indeed, the *Enterprise* has had its fair share of difficulties, including system crashes and staff re-organizations. However, the hands-on nature of pagination places much of the control with the user. Again, this score may be a product of an inconsistent technology not giving its user much say over its control.

This study also hypothesizes that *the greater the relative advantage and compatibility, the more the newspaper's content will be perceived to have improved.* In Beaumont, the editorial control index score (also indicated in the bar chart) was an expected and relatively low 21.9%.

The Beaumont pagination system, as mentioned before, gives management and copy editors total control over the composing system. But its inconsistent performance and its lack of compatibility with expectations apparently helped foster the impression that editorial content could potentially suffer. Granted, the PLT is a design tool and not a news tool. Still, the perception is that pagination is not a journalistic instrument; rather, it is viewed as a money-saving, control-intensive production technology. And while it cannot be said with certainty that the Beaumont PLTs have adversely affected news content, some staffers would say that the technology has not helped.

Theory and Summary

Several observations can be made about the Beaumont pagination system within the theoretical implications discussed in Chapter Three.

First, the technology has influenced some organizational change and, subsequently, organizational behavior. Pagination has necessitated reorganization of copy editor work schedules and, more importantly, has changed the nature of work -- and thus behavior -- of all copy editors in that they now have more control over and more responsibility for the finished product.

Second, interaction of people and technology has affected organizational change. In Beaumont, this occurred in various ways. For example, copy editors now allot more planning time for copy editing so as to be more efficient when their turn comes to work on a PLT. The increased planning, while more efficient, discourages spontaneity and last-minute changes in page design.

Third, technology diffusion is not always a manifestation of organizational change. In the Beaumont case, the reverse was true: Organizational change often is made to accommodate technology diffusion. The obvious example, again, is the work schedule rearrangement.

Fourth, technology diffusion and use is influenced by the perceptions of those using the technology. This is somewhat true at *The Enterprise* in that copy editors' reactions and experiences with the PLTs influenced the thinking of management as to how to make better use of the technology. So, in effect, management influences the rate of diffusion.

Finally, job task and compatibility influence diffusion. With the PLTs, this is obvious because the PLTs are meant to conform to ideas and concepts of copy editing and page design. Had PLTs not been so designed, their diffusion obviously would be more limited to far less than the extent reached in Beaumont.

The Beaumont Enterprise and the page layout terminal apparently have enjoyed a satisfying-yet-stormy union. Staff reaction to PLTs and the quality of their coexistence with the machines varies.

The newsroom enjoys enhanced control over the product, but distrusts the system giving it that control. PLTs efficiently motivate some and alienate others. PLTs enhance recruitment of the young and others but simultaneously dissatisfy some copy editors by fostering the loss of some attention to journalistic detail and by frequent "crashes" and unmet expectations.

PLTs in some instances provide a much greater degree of text and graphic manipulation than *The Enterprise* ever experienced, but also partly encourage a certain amount of laxness toward publishing late-developing news. Management believes the system is good and yet has a wait-and-see attitude in evaluating the system.

There is a distinct fear of past history at *The Enterprise*. Management was understandably cautious where PLTs are concerned because of the bad experience with the system. Copy editors were concerned because of frequent "crashes" -- perceived or real -- and management's history of technology implementation. Middle managers were concerned about some aspects of content quality that they believe PLTs discouraged. Reporters were concerned because late-breaking stories have not received the prominence they may have deserved. Many such concerns were compounded by deadline pressures -- either in the time that PLTs require for page design or the PLT shortage-created sense of "hurriedness" -- and organizational constraints, such as newsroom and building design or staffing levels.

Whatever causes the copy editor to fear history overshadowing his more positive accomplishments, the page layout terminal system is a technology fairly well accepted, given its unfortunate beginning. Time and the willingness (or lack thereof) of *Enterprise* copy editors and managers to adapt will determine whether PLTs garner more acceptance and, consequently, success.

CHAPTER SIX

CASE 3: PERSONAL COMPUTERS AT *THE AMARILLO GLOBE-NEWS*

Definition of the Technology "System"

The Community

Amarillo is Texas' 10th largest city, set in Potter and Randall counties in "the Panhandle," extreme northwest Texas. Amarillo has about 150,000 residents.[1]

The local economy is diverse. Although three industries -- farming, cattle ranching and petroleum -- are thought to predominate,[2] nearly half (46 percent) of the more than 83,000 local jobs are either in retail trade or services (more than 15,000 in professional and related services, such as schools, hospitals and social services).[3] Amarillo's largest employers are its school system (nearly 3,500 employees) and Pantex -- a privately managed facility that is the final assembly point for all American nuclear warheads -- which employs about 2,700 persons.[4]

In 1980, Amarillo's unemployment rate was lower than that of the state -- 3.4 percent, compared to Texas' 4.0 percent.[5] Since then, however, the economic situation has deteriorated. Falling world oil prices and continued decline in the agricultural industry and their consequent rippling effects led economists to predict a slow recovery for the Panhandle.[6] Amarillo's unemployment rate in fall 1986 was a historically high 7.9 percent and the figure had started to include a substantial number of middle managers and administrative personnel.[7]

Some figures indicate that Amarillo property owners shoulder one of the highest tax burdens in Texas. A recent study reported that among Texas' 21 largest cities, the combined tax rate of all taxing entities in Amarillo is the third highest.[8]

Amarillo also is one of three sites under consideration for the nation's first high-level nuclear waste repository. The issue -- unlike the Pantex plant -- has stirred deep opposition, and attempts to delay the site's land-acquisition process via congressional legislation were being made in June 1987.[9]

Despite such conditions, the Amarillo Chamber of Commerce is trying to hasten the transition from oil and gas to manufacturing, service and tourism. Chamber officials hope to improve the city's chances of sharing the billions of federal dollars expected to be spent on a proposed strategic missile defense system in space.[10]

The city has its share of positive accomplishments. Amarillo's cost of living in the third quarter of 1986 was below national levels in grocery items, housing, utilities, transportation and health care[11] while the April 1987 unemployment rate of 6.1 percent was fourth lowest among the state's largest metropolitan areas.[12]

The Newspaper

Amarillo has three newspapers in one. *The Amarillo Globe-News* publishes *The Amarillo Daily News* every morning except Sunday, *The Amarillo Globe-Times* every evening except Sunday and *The Amarillo Sunday News-Globe*. The combined circulation[13] of the morning and evening newspapers is about 70,000, with *The Daily News* the larger, 43,321 to 26,906.

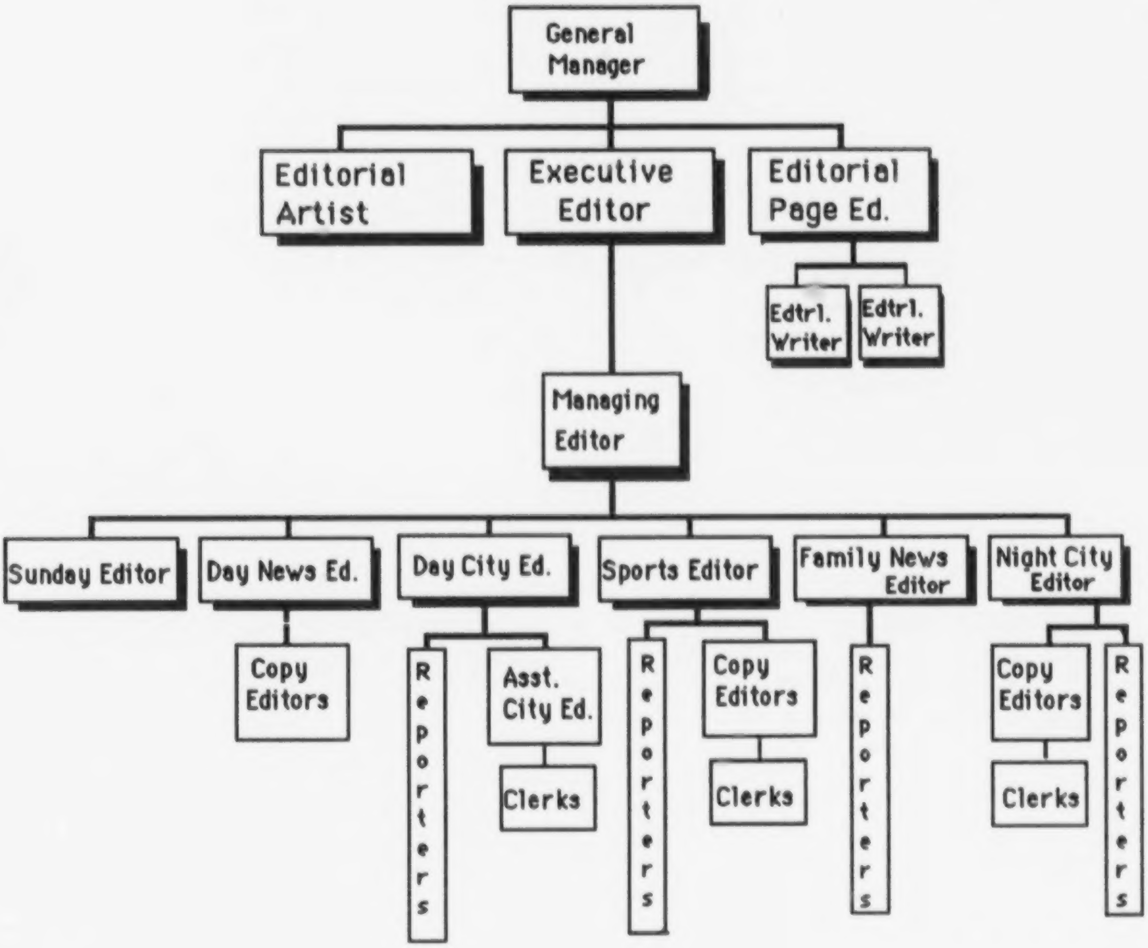
All three are collectively and commonly called *The Globe-News* (it is not unusual to see the newspapers describe their reporters in bylines as a "*Globe-News* Staff Writer" in bylines) and are part of Southwestern Newspapers Corp., a division of the privately held Morris Communications Corp., of Augusta, Ga. Morris publishes 17 daily newspapers in seven cities, six weekly newspapers in Florida, Georgia and South Carolina and bi-monthly publications in Texas,[14] employs more than 3,000 people and has more than $70 million in sales.[15]

The Globe-News news-editorial department is organized much like other newspapers (see Figure 6.1). The chain of command begins with the executive editor, to the managing editor and on down to

Figure 6.1

Organizational Chart for

Amarillo, Texas, Newspaper Group


General Manager
Editorial Artist
Executive Editor
Editorial Page Ed.
Edtrl. Writer
Edtrl. Writer
Managing Editor
Sunday Editor
Day News Ed.
Day City Ed.
Sports Editor
Family News Editor
Night City Editor
Copy Editors
Reporters
Asst. City Ed.
Clerks
Reporters
Copy Editors
Clerks
Reporters
Copy Editors
Clerks
Reporters

the sub-editors, which are further divided according to whether they work for the morning or evening newspaper. The chief photographer, librarian and the family news, sports and Sunday editors work for both newspapers. During the researcher's visit, the managing editor's position was vacant.

Reporting staffs are somewhat separate. Eight reporters make up the morning paper city staff and 13 reporters compose the evening paper city staff. Those covering certain topics with regularity ("beat reporters") write for both newspapers, as do all six sports reporters. The average news reporter had worked for the morning newspaper somewhat less than 1.5 years while the average evening newspaper reporter had worked slightly more than 1.5 years.[16]

The newspapers are the only daily newspapers in Amarillo, the largest newspaper in the region and thus have no competition, per se. Management believes the staff competes with itself, motivated by dedication, pride and a sense of professionalism.[17]

The newspaper's community role, therefore, is as the newspaper of record, and its mission is to report the news truthfully, honestly and fairly. But the current economic decline prompted some -- including T. Boone Pickens, oilman and probably Amarillo's most famous citizen -- to doubt whether that has been accomplished at times.[18] Specifically, certain businessmen felt the newspaper dwelt too heavily on negative news, such as bank failures, declining cattle and oil prices and governmental excess,[19] to which management has said:[20]

> Businessmen do not understand the role of the press...They really believe that there is no point in putting bank closings and things like that in the paper...Our responsibility is to our public...to tell it like it is, but not necessarily to "overtell" it, to overkill and to go looking for the bad news things and to never acknowledge the positive things when *they* occur.The businessman sees it (via) tunnel vision only: "It's bad for business! God, don't say that (the city has) the highest rate of taxation in the state of Texas. Hell, there are no businesses coming here. That's going to hurt my business. I'm not going to sell as many suits. Don't put that in there!" They don't understand that perhaps by telling it like it is, then perhaps some of these governmental entities will get off their duff and maybe do some things that will affect the long-term, positive health of the community. So where Boone is coming from, and some others in the community -- "too much negative news, too much investigative reporting" -- that's a joke because whoever thought of the Amarillo paper as being an investigative prima donna?

History and Innovation Process.

Since the 1960s, Morris Communications has been at the forefront of newspaper technology adoption. It was then that the company used a computer to set type at its three Georgia newspaper plants -- *The Augusta Chronicle and Herald, The Savannah Morning News and Evening Press* and *The Athens Banner-Herald and Daily News* -- linked by telephone to the computer in Augusta because management reasoned that leasing telephone lines would be cheaper until it could afford two more computers.[21]

The company also pioneered front-end systems -- "dumb" video display terminals tied to a central computer -- and also formed Compudat, its own software-writing component. This subsidiary later entered an agreement with a hardware vendor to develop software for the vendor's front-end equipment. But the combination seemed to outlive its usefulness by the early 1980s, at which time Compudat developed the idea that led to the current hardware and software at all Morris newspapers.[22]

The idea meant writing a news-editorial software program for the IBM personal computer, which then would be networked (allowing multi-user sharing of information) for newsroom purposes and provided with the appropriate backup capabilities and service -- at a fraction of the cost a vendor would ask. After a few months, a prototype was developed for the Augusta newspapers:[23]

> We also wanted complete and total compatibility throughout Morris newspapers, so that our bureaus could communicate. Our folks fully understood what the needs of

> the newsroom were. And when the hardware came on the market, we decided to take advantage of it...The personal computer is a tremendously powerful machine.

The personal computer ("PC") also has proven to be increasingly popular of late in the newspaper industry as a whole. As recently as 1984, a survey showed more than 300 newspaper plants using PCs, 60 percent of those in the news department. Still, editors have been concerned about PCs' ability to be networked, secure, compatible and work-efficient.[24]

Many doubts, however, disappeared over the years. One study showed that more than 430 U.S. and Canadian newspapers projected 1987 PC expenditures would be nearly 21 percent more than 1986 PC expenditures -- a rate double the rate of increase for all equipment purchases.[25] PCs also provide competition for some front-end systems because of enhanced speed and data-storage capabilities and reduced costs.

Many newspapers bought front-end systems around 1977. But as newspapers' needs changed, so did their understanding of their computer needs. As a result, many newspaper executives replaced their systems by selecting the best from many sources -- i.e., with a new front-end system, with a PC system, or with a combination of the two.[26]

In 1985, *The Amarillo Globe-News* installed its IBM personal computers, and Morris corporate trainers and software developors conducted a week-long training period for supervisors and editors. Each training session lasted a half-day and trainees participated with the understanding that they would train subordinates. All departments except classified advertising were then trained on the new system -- hardware and software. Classified department training came later.

General Operational Background

Each computer unit has three parts: a keyboard (with 3 keypads: lettered functions to the left, regular typing functions in the middle and numbered functions to the right), a monitor and a central processing unit (CPU). All units are networked and each user has a "pair," i.e., regardless of where a reporter works, all his work automatically copies into his "pair" for backup.

A reporter enters the system ("logs on") by pressing the System Commands key at the top left of the main keyboard. The computer requests his personal security code, which the reporter enters before pressing the Enter key. To start a story, the reporter presses the F1 key -- all function keys are in a separate bank of keys at the left of the main keyboard -- and then follows directions. The screen cursor usually is red (for the overstrike mode), unless the insert mode has been activated (using the Ins key at the bottom left of the right bank of keys), in which case the cursor will be purple. To leave the system ("log off"), the reporter presses the Shifted F8 key.

To file the story, the reporter presses the Shifted F3 key. To retrieve the story, the reporter presses the F10 key, types the story's directory name (which depends on which newspaper is to get the story) and presses Enter. The reporter then places the cursor on the colon symbol at the beginning of the desired directory entry and presses the F7 key, making the story appear on the screen.

Editors may move, copy and delete blocks of type by using the F6 key. Before activating the function, the cursor is moved to the beginning of the block of type that the editor wants to manipulate. Then he presses the F6 key and moves the cursor down or across the screen to highlight the chosen block of copy, which then turns red. The editor then presses M for move, C for copy, or D for delete. When moving or copying text, the editor places the cursor at the desired destination, again pressing F6 to complete the command.

Monitor screen's color also is function-oriented. Generally, reporters work on a blue screen (a screen with a blue strip at its top). But should a reporter in mid-story need to take some quick notes or type a short story, he doesn't have to file the first story. He can move to a green screen by pressing the Ctrl PgUp key, which makes the top of the screen green and allows the reporter to do everything he can do on a blue screen. To return to the blue screen, the reporter presses the Ctrl PgDn key and finds the text of the first story awaiting him. Copy also may be manipulated between the two screens via the manipulating functions mentioned above.

The PC screen also may be split via the F8 key while on the blue screen. This enables the reporter to simultaneously see a story in-progress on the blue screen and notes on the green screen.

The reporter may move the cursor to either screen by using the Ctrl PgUp and Ctrl PgDn keys. The color at the screen top indicates which screen is being used. Copy also may be manipulated in this split screen mode by using the manipulating functions mentioned above.

Other features include a dictionary. If a reporter misspells a word and doesn't know the correct spelling, he may access the dictionary by placing the cursor close to the end of the word and pressing the Shifted 5 key at the right of the keyboard. That places him in the dictionary area. If he finds the word, the computer then will direct him on how replace the misspelled word. If the word originally was spelled correctly but is not in the system dictionary, the reporter may insert that word into a temporary dictionary. The word will turn yellow and remain so when sent the story is sent to an editor.

The system also allows reporters and editors to send and retrieve story copies to and from other PCs, to copy and delete stories, to store frequently used words, phrases, sentences and codes for future use and to send stories to the Associated Press news service or to another Morris newspaper (see Figure 6.2). Each PC's floppy disk drive -- built in addition to its hard (internal)-disk drive -- also safeguards stories by allowing users to save their work on a floppy disk.

Methodology

As mentioned in Chapter Three, the study's protocol framework called for an initial focus on the technology, followed by questions and observations centering on managerial, employee and environmental interaction with the technology.

In the Amarillo case, the researcher contacted the general manager, who then referred the researcher to the executive editor. The executive editor served as the primary liaison between the researcher and the case participants.

Once granted access, the researcher interviewed and observed most *Globe-News* PC-using employees in accordance with the previously mentioned strategies, guidelines and protocol. Employees were observed operating the technology and in their daily routines and work habitat. Interviews were scheduled at the interviewees' convenience and usually in a private office or conference room.

Several *Globe-News* reporters and writers were interviewed. The researcher also interviewed the executive editor, day assistant city editor, night city editor, family news editor, night news editor, two copy editors and two production maintenance employees. Attempts to interview sports reporters were unsuccessful because of scheduling conflicts. The majority of -- but not all -- interviews were tape-recorded to complement the researcher's notes.

Employee Users and System Impact on Work

Direct Impact

Personal computers have had various effects on *Globe-News* reporters, writers and copy editors, depending on job functions.

Reporters find their jobs are made somewhat easier, typically in news writing. PCs facilitate spelling, word and paragraph manipulation, meeting deadlines, rewriting and communication with editors. The split-screen function allows a reporter to take notes from a telephone conversation for a story that he may be in the midst of writing. The blue screen/green screen function allows him to work on two stories simultaneously.

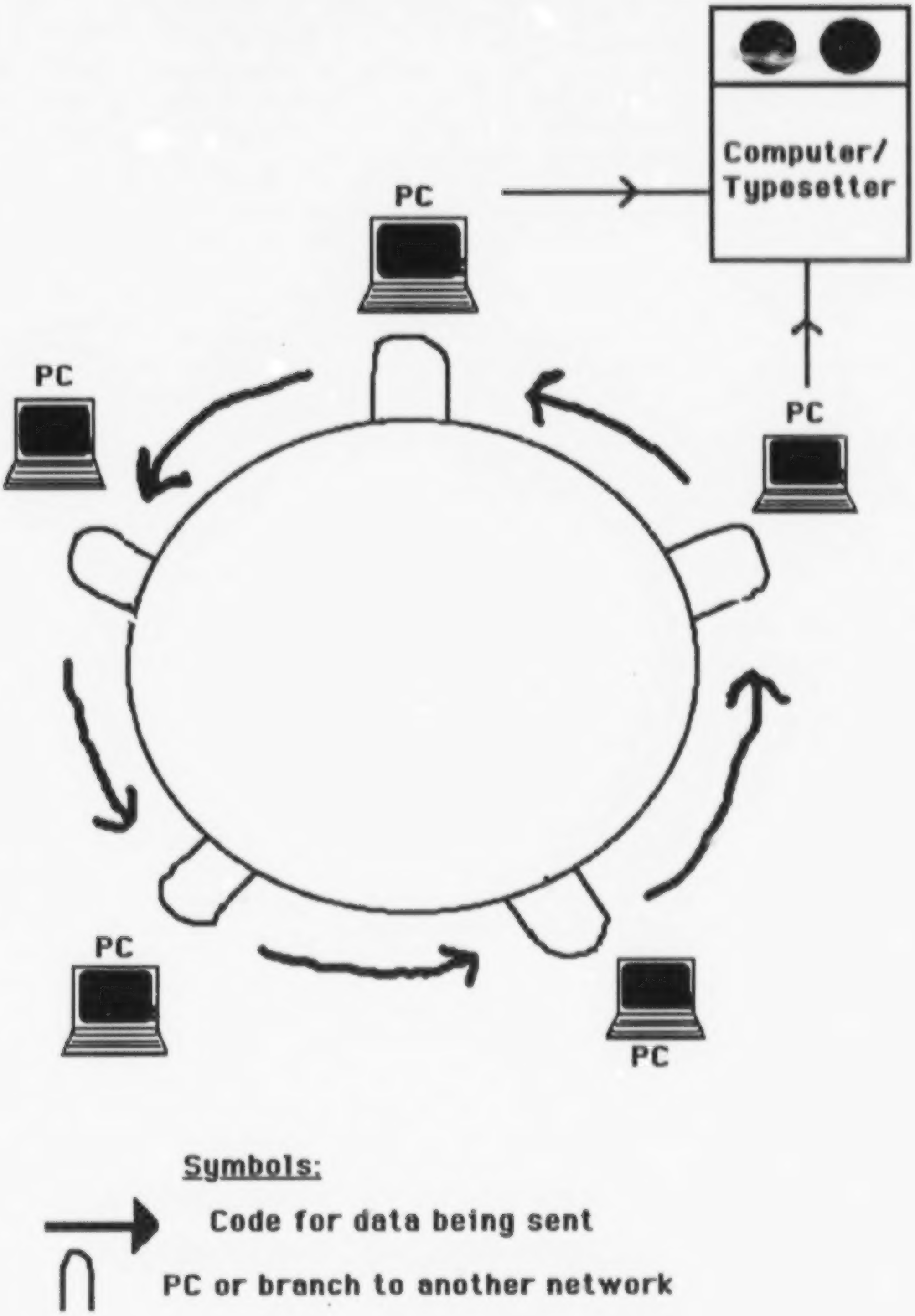
PCs also benefit certain writing subtleties, as one *Globe-News* reporter noted:

> My brain has a tendency to get ahead of my fingers and I can work a little faster on a computer than I can on a typewriter. So the particular set of words that I have in mind probably gets to the paper in its original form a little more often because of that speed. My first concepts probably get on the page a little more often.

The PC also serves as a resource in its ability to file and securely save stories as well as reveal other information sources via the various news services' ("wire") directories. This function especially aids the editorial writers, who use such information in their opinion research. Before PC adoption, editorial writers had to endure an elaborate process for access to news service copy. Basically, the

Figure 6.2

Amarillo Personal Computer Network


Computer/
Typesetter
PC
PC
PC
PC
PC
Symbols:
Code for data being sent
PC or branch to another network

process meant locating and obtaining wire stories (on sheets of paper or "hard copies") from copy editors who had already used the material for the newspaper. So haphazard was this process that most editorials simply relied on those wire stories that had appeared in the newspaper. Editorial writers now simply read the wire directories on their PC monitors.

Copy editors generally find that PCs increase editing capabilities. With the PCs' moving, copying and deletion functions as well as with the built-in spelling corrector, copy editors can edit more quickly than before, meeting deadlines earlier and with more regularity. However, reporters sometimes use this extra time to attempt to change stories already edited, as one copy editor related:

> The extra work is in our relationship with reporters. Since it's easier to change stories on this system, they use it to their advantage, which is to our disadvantage. They're "refining" it after they've supposedly turned it in, although sometimes they catch major errors in the copy. Reporters also have "extra work" in that they must delete outdated or unwanted stories from their own directories. This can be a minor or a major job, depending on the volume of stories in the directory. The system's "PC pair" function, which automatically puts a copy of a reporter's story in another reporter's directory, complicates this purging because often reporters are not aware of the relative importance or value of their "pair" reporter's stories. Thus, some unwanted deletions occasionally occur.

Those who remember that the previous system automatically purged stories -- regardless of the story's value -- don't mind such a chore."Many times you had to type in something and make a line print because the system was purging all the time because it would fill up so fast," said one reporter.

Indirect Impact

Installation of PCs probably has had more effect on *Globe-News* employees' attitudes and beliefs than on actual work habits.

Most of the reporters, writers and copy editors are quite satisfied with the PCs, especially when comparing the system to the front-end system it replaced. They claim that work is more pleasant, "seems to go a little smoother," and that morale improved when PCs were installed. Much enthusiasm is connected to the security that the system provides for the product:

> You're not frustrated like you were before. With the old system...you weren't sure if you were ever going to be able to finish a story without losing it once or twice. But with this system, there are no surprises in store. It's fairly predictable in what it can do and it's very responsive. That fits into how you generally feel about your job. With the old system, it seemed that too often it was in the way between you and the final product. But here (with the new system), it sort of facilitates that process. It makes it so you hardly even notice there is that sort of system needed. You take it for granted because it is so convenient. It's so efficient in the way it operates. You just write it (a story) and, the next thing you know, it's in the paper.

In enhancing writing, the PC also has brought reporters in closer contact with immediate supervisors. The contact usually revolves around the PC itself, either concerning a problem or some new function that needs to be learned. Reporters often turn to the department head in such situations, primarily because these managers usually trained the reporters to use the PC system. Still, no reporter, writer or copy editor reported receiving much, if any, feedback from these managers regarding their work on the PC. The primary feedback comes through the normal manager-subordinate contact concerning a story or methods to cover a story. The PC has not changed that situation much. As one editorial writer said, "As far as a writer is concerned, one terminal is as good as another."

In fact, many reporters, copy editors and writers are hard-pressed to find fault with the PCs. Most PC improvement suggestions were often qualified as "minor" or "just a small thing." These suggestions ranged from a quicker response time to 100-word summaries of wire stories to automatic purging to a less-religious orientation in the spelling checker (e.g., "god" is incorrect; "God" is correct).

Managers/Supervisors and System Impact on Work

Direct Impact

In general, the the PC system pleases editors as much as it pleases subordinates. The effect on the editors' jobs, however, is not as consistent.

For example, mid-level editors agreed that PCs have made their jobs somewhat easier in the handling of the editorial product. Simply editing reporters' stories is easier, thanks to the PCs' word and text manipulation functions. Also, as stories become better written and reported, actual editing time is shorter. This leaves more time for other, more supervisory duties, but only for some editors. Other editors do their jobs in the same ways as before PC installation.

A specific case involves three editors with similar jobs. One editor claimed no easier or extra time for motivating reporters. Another editor, claiming PCs shorten editing time, used that time to deal "with the sort of things you really need to deal with as a manager: giving reporters feedback, organizing things, keeping track of things." Still another tried to deal with PC-driven staff motivation:

> I think I'm balancing two different kinds of staffs -- staffs who always think we've had machines and don't see anything different and the staffs who are still getting used to machines -- and (I) realize that part of them are going to be bored out of their gourd with technology and that part of them have really intense desire to learn. Not every reporter's going to need to know the total ins and outs of the system.

As a result of individual managerial efforts and perceptions, then, the PCs have had varying effects on managing except in organizational matters. No reporting staff reorganization occurred because of PCs or to accommodate PCs.

Instead, *The Globe-News* created a system involving a shared clerical pool, basically consisting of the receptionist and obituary, dictation and sports clerks. These people, many of them college interns, type routine material into the appropriate directories and often into "formatted" (fill-in-the-blank) stories that are then checked for accuracy and errors by the editors. If not for these clerks, reporters would have to do this work "and that's very bad for morale. No one wants to go to journalism school for four years to be a typist," an editor said.

Regarding other management functions, the PCs allow quicker evaluation in a sense. Prior to the new system, editors -- to inspect a reporter's story -- had to go to the reporter's desk, lean over the reporter's shoulder and see what was being typed. With the PCs, an editor need only call up the reporter's directory and retrieve the story. The split screen function also allows an editor to simultaneously view and compare an edited version of a story with the unedited ("raw") version.

The PCs also facilitate some managerial planning. Editors now maintain an electronic file of stories to come ("the advance book") in their PC directories. This file previously consisted of actual newspaper clippings and datebook notations. The newspaper also maintains an Amarillo sources file. Each file is easily retrievable and facilitates story budgeting in that no more physical items -- such as paper and pens -- are necessary in such planning. Another editor maintains a list of reporter's regular assignments ("beats") and refers to this file whenever doubt exists about which reporter is to cover a certain topic. Still another editor maintains a stylebook for reporters' reference.

Editors also found their training duties increased. Since editors were the participants in the primary training sessions, the editors are expected to teach reporters and copy editors how to use the PC system. Some delegated this authority to their assistants, although, in some instances, with hindered communication when a PC-related issue arises. "You need to be working on the same vocabulary," said one editor.

Indirect Impact

If PCs affected all editors' jobs differently, the same is not true of editors' attitudes. The mid-level managers overwhelmingly believed PCs have improved their job performance.

They felt more productive because of the PCs' abilities and their consistency in delivering those abilities: total story control, a larger capacity and memory than the previous system, few "crashes," added flexibility and greater speed and accuracy in editing. This perception of increased productivity also seemed associated with an enthusiasm for the system. Moreover, it was not uncommon to find more enthusiasm for the PCs among those editors who had taken extensive PC training prior to the system's implementation. Consider three editors in different departments:

> EDITOR #1: I think I'm a lot more enthusiastic (in comparison with other *Globe-News* editors) about what a computer can do, and I have really been very available whenever there was extra training or something like that for PCs...I also think there is this technical power (available) because we know what the machine can do. The more you know what it can do, the more work you can get out of it, and I really like that.

> EDITOR #2: I see myself as pretty good (in comparison with other *Globe-News* editors)....I just had this gut feeling that if I didn't learn it (how to operate the PC), then I would never know some of the things that it could accomplish...I felt very strongly that I needed to know it because reporters were going to have to know it and they were not going to get the training. When you signed up for the thing, you agreed to teach people -- and before I ever sat down with a group of reporters I had to know.

> EDITOR #3: I saw what they (PCs) could do and I think I recognized the potential to do things that weren't possible (before). So I decided early on that if I learn all I could find out to use this thing, I could manage it to get out a better newspaper. The alternative is, if you don't, it's going to manage you.

Of those editors interviewed, however, most *Globe-News* editors interviewed reported receiving no formal feedback from superiors about their PC work.

In contrast, editors used the PC to communicate with their reporters. The managers often used the PC in-house mail directory to send messages regarding stories, assignments or personal items. One editor reported a decrease in verbal contact with reporters as a result of an increase in the use of the PC's communicative powers.

Environment and System Impact on Work

The Globe-News newsroom, similar to others across the country, is composed of departments that occupy various rectangles of space and each rectangle has a few PCs. In most departments, however, there are more reporters than PCs. Generally, that situation presents not much of problem.

On the local news desk, dayside and nightside reporters share PCs. There usually is only one time period -- from about 2 p.m. to 5 p.m. on weekdays -- when both groups occupy the newsroom. But not all reporters write at the same time, so there still is not much of a PC shortage. And when there is, a reporter can usually move to another department and find an available PC.

In the family news desk area, however, two PCs are available for five people. At times of PC shortage, the family news editor must request staff members to get story hard copies to be edited instead of doing so on the PC. Usually, however, family news staffers must find an available PC elsewhere in the newsroom. These staffers consider this a major problem because it may mean no access to a telephone or their personal telephone directories in addition to having to carry the materials necessary to complete their writing tasks. These persons -- all female -- are teasingly called "the bag ladies of the newsroom" because of this situation.

The same problem exists to a lesser degree for the editorial department, with two PCs and three staff members. One PC is in the chief editorial writer's office, meaning that one of the two remaining staffers must leave the department area to find a PC (usually in the sports department). *Globe-News* staff members do not, as a whole, consider this to be a major problem. As one of the affected editors said:

> It would make one whole helluva difference if we had access to another terminal that was close. But on the other hand, we've got more of these than we did on the old system, so it's better. I guess you're never happy 'til everybody's got one.

Otherwise, the attitudinal atmosphere in *The Globe-News* newsroom is relatively harmonious. Most reporters, writers and copy editors believe their supervisors to be good, effective and fair managers who give subordinates the proper respect, autonomy and encouragement necessary. As one reporter said, "They (editors) know we're still pretty green around here and that we have a lot to learn. They've been real patient." Editors, for their part, seem more than willing to fulfill this training-teaching function.

Not surprisingly, staff members see PCs as enhancing the editorial product. The reporters see their stories as getting better editing and being published with fewer errors. Editors see the same results, in addition to fewer sheets of paper to deal with, faster copy editing, fewer steps in the editing flow, more accuracy in designing and planning pages and a much greater range of tasks accomplished more quickly. In general, managers believe they possess the extra, added knowledge that they can do more with and to the product -- in other words, more control.

The PCs, obviously, play a major role in shaping this attitude of improved quality. Every editor interviewed mentioned the enhanced speed that PCs provide. Upper management sees this as a competitive advantage in that PCs allow *The Globe-News* to get more information in a more timely fashion into the newspaper. "It has allowed us to compete against time more than anything else," said one editor. He continued:

> If you've got a newsroom full of state-of-the-art equipment, it is easier, one, to recruit top-quality people; secondly, to keep them motivated. If you're in a real good, wholesome, professional environment, I think it's easier to remain motivated. It's just one less thing to gripe about. I think we who supervise tend to push people, in our business particularly, with cruel-type deadlines, and I think those deadlines are more accessible because of the equipment, so you have less flack.

Motivation, in *The Globe-News*' case, is important because of the relatively young staff and the relatively high reporter turnover. Management tends to view such staff change as a positive sign that the training provided by editors is appropriate and doing what it is expected. The addition of the PCs didn't hurt motivation, although initial management response was somewhat apprehensive:

> Probably any time that the corporate level is planning a big change...at least a certain percentage of the people at that plant would (like to) be asked, "What do you think?" Pretty well the decision was made, those PCs arrived, and I think there was some apprehension...but for the most part, those of us who've been here know that the company has always gone first class on equipment, and so we know that anything else they want to look at, we know it's going to be good. We know it's not going to be junk.

Still, upper management will evaluate and use its hardware eight to 10 years before it will consider replacing the PCs. As long as the PCs avoid consistent "crashing", maintain their speedy response times and the software meets the newspaper's needs, then the PCs will remain at *The Globe-News* for the full 10 years.

Relationships

This study will attempt to show that *the greater the relative advantage and compatibility of a technology, the less likely will the manager need to pursue motivational and controlling measures in* *getting his subordinates to adopt the technology*. To determine whether this relationship held in the Amarillo case, the researchers again used the indicator indices mentioned in Chapter Three.

On the relative advantage, compatibility and editorial content indicator lists, an asterisk beside the number of the item indicates that a "yes" response to that item was considered to the technology's advantage in that situation. Those items without an asterisk would have necessitated a "no" response for the item to be considered to the technology's advantage. The total of such "yes" and "no" responses, then, was then divided by the total number of items to achieve the index score for each of those variables.

Although the same coding process was followed on the motivation and control lists, the index score was computed differently. For example, if a motivation item list indicated that 28 of the 32 items were favorable, instead of using the favorable answers to construct the score, the number of unfavorable responses were used to indicate the amount of motivation or control needed, in accordance with the relationships the study attempted to show.

A complete listing of the questions (and responses) for each indicator/variable appears on the following pages.

Relative Advantage Operational Indicators

*1. Is there less work than before for managers? (N)
*2. Is the technology more efficient than its predecessors? (Y)
*3. Does the technology leave the manager more time for other duties? (Y)
*4. Does the technology give the manager more flexibility in his job? (Y)
*5. Do the tradeoffs necessitated by the technology tend to be more positive than negative? (Y)
*6. Was the technology easy to learn? (Y)
*7. Is it easy to teach newcomers how to operate the technology? (Y)
*8. Was a trial run performed? (N)
*9. Has the newspaper's competitive environment, on the whole, been enhanced by the technology? (Y)
*10. Has staffing been reduced because of the technology? (N)
*11. Are managers more productive because of the technology? (N)
*12. Are employees/users more productive because of the technology? (Y)
*13. Is communication with the consumer enhanced by the technology? (N)
*14. Do managers generally have a positive attitude toward the technology? (Y)
15. Do managers desire any major changes in the technology's design? (N)
16. Do managers desire any major changes in the technology's current performance? (N)
17. Do managers desire any major changes in the technology's current method(s) of operation? (N)
*18. Are deadlines easier to attain because of the technology? (Y)
*19. Is there less work for the employee than there was before the technology? (N)
20. Was much additional training of employees required? (N)
*21. Does work flow more smoothly with the technology than without it? (Y)
22. Have intra-staff communications increased since the technology was adopted? (N)
*23. Do editors/managers feel any sense of reward or accomplishment that did not exist before the technology? (Y)
*24. Was the previous technology (or the situation preceding adoption of the current teachnology) perceived as a high-risk situation? (N)
*25. Does the current technology save time? (Y)
*26. Does the current technology represent increased prestige in any capacity compared to its predecessor? (Y)
*27. Was the technology adopted because of crisis-related reasons? (N)

Compatibility Operational Indicators

1. Has the manager's job changed significantly because of the technology? (N)

2. Has the employee/user's job changed significantly because of the technology? (N)
*3. Does the technology completely satisfy managers? (Y)
*4. Does the technology completely satisfy employees/users? (Y)
*5. Does the technology make the jobs of employees/users easier than before? (Y)
*6. Does the employee/user's job get completed via the technology without any unusual difficulties? (Y)
*7. Does the technology coincide with the employee/user's perception of what his job should be? (Y)
8. Does the technology change the skills that managers need in order to do their jobs? (N)
9. Do managers yearn for the previous technology/situation? (N)
*10. Is the technology "invisible"? (Y)
*11. Is the technology consistent with managers' views of "the way the paper should go"? (Y)
*12. Is there less work for the manager because of the technology? (N)
*13. Is there less work for the employee/user because of the technology? (N)
14. Have the managers' responsibilities increased because of the technology? (N)
*15. Does the technology meet the needs of the manager? (Y)
*16. Does the technology meet the needs of the employee/user? (Y)
*17. Does the technology help to normalize newsroom operations? (Y)
18. Did the technology require the prior adoption of a new value system? (N)
*19. Does the technology yield quickly observable results? (Y)
*20. Does the technology enhance marketability of employee/users? (Y)
21. Do employees/users perceive themselves as "deviant" from other employees because of the technology? (N)
*22. Does the technology coincide with newsroom views on acceptable innovation? (Y)
*23. Does the technology represent "the natural progression" of innovation to employees/users? (Y)
*24. Does the technology represent "the natural progression" of innovation to managers? (Y)
*25. Does the parent-corporate culture encourage adoption of the technology? (Y)
*26. Does the technology pave the way for adoption of other innovations? (Y)
27. Does the technology foster or create a new value system for its users/operators and managers (compared to the rest of the newspaper)? (N)

Motivation Operational Indicators

1. Have any new motivation programs been initiated because of the technology's adoption? (N)
2. Have the incentives to work changed because of the technology? (Y)
*3. Do employees have any say about the product? (N)
4. Do employees dislike their supervisors? (N)
5. Has supervisory feedback to employees been largely negative? (N)
6. Do employees believe that their supervisors are incompetent? (N)
7. Are employees unhappy in their jobs? (N)
*8. Are employees happy with the technology in general? (Y)
9. Do supervisors displease employees in the supervisors' dealings with the technology? (N)
10. Do the supervisors make employees' jobs more difficult in regard to the technology? (N)
*11. Is the technology appealing to employees? (Y)
*12. Are employees hapy with the skill changes the technology requires? (Y)
13. Do employees feel less productive with the technology? (N)
14. Do employees have more work to do with the technology? (N)
15. Do employees feel negatively different from other employees because of the technology? (N)
16. Does the technology system often "crash"? (N)
17. Do employees feel incompetent using the technology? (N)
18. Are overall employee relations worse since the technology was adopted? (N)
*19. Were employees consulted in the selection of the technology? (N)

*20. Was there a trial run for the technology? (N)
21. Does the technology directly place the employee in a personnel conflict of any kind? (N)
*22. Have job descriptions or duties changed for the better because of the technology? (N)
23. Is the technology difficult to learn? (N)
24. Does the technology put any constraints on the product? (N)
25. Does the technology constrain communication with readers/consumers? (N)
26. Do employees see any problems with management's intentions concerning the technology? (N)
27. Do only employees use the technology? (N)
28. Does the technology induce any anxieties, stress or tensions among the employees? (N)
29. Does the technology punish, reprimand or negatively react to employee/users' mistakes? (N)
30. Does the technology inhibit intraoffice communication? (N)
31. Does the technology inhibit employee/user creativity? (N)
32. Does the technology create any interdepartmental conflict? (N)

Control Operational Indicators

1. Do managers evaluate their staffs differently because of the technology? (N)
2. Do managers take more time for evaluations and monitoring since the technology has been adopted? (N)
3. Has any re-organization occurred because of the technology? (N)
4. Has any re-staffing occurred because of the technology? (N)
5. Are technology "gurus" often consulted? (N)
*6. Do managers often act as technology "gurus"? (Y)
*7. Do managers use the technology -- as a criteria or as a method -- in conducting employee evaluations? (Y)
8. Does the technology system often "crash"? (N)
9. Does the technology system often have to be updated, revised or checked? (N)
*10. Did employees/users have adequate technology training? (Y)
11. Does the technology system impair employee performance? (N)
12. Are economics a consideration in operating the technology by users? (N)
13. Has the technology fostered any negative behavioral reactions? (N)
14. Does management have unrealistic performance standards in evaluating the technology system? (N)
*15. Are employees/users involved in the control process concerning the technology? (N)
*16. Is there an ultimate authority concerning the technology's operations? (Y)
*17. Does surveillance of employees get adequate managerial attention? (Y)
*18. Are there any policies or long-range plans concerning technology problems? (N)
19. Do managers spend more time on non-production aspects of the technology rather than on production-related matters? (N)
*20. Does the newspaper have any documentation or training manual concerning the technology? (Y)
21. Does the technology's performance depend on other departments? (N)
22. Do most employees/users distrust management's technology expertise? (N)
*23. Does management trust employees/users in their use of the technology? (Y)
*24. Do employees have more autonomy on the job because of the technology? (Y)
*25. Does management have clear, stated criteria in evaluating the technology? (N)
26. Are control and stabilization of the technology difficult to maintain at times? (N)
27. Is the technology system frequently audited? (N)
*28. Are there quantitative standards that employees/users must attain in operating the technology? (N)
*29. Are there time standards that employees/users must attain in operating the technology? (Y)
30. Does any overcontrolling exist in regards to the technology? (N)
*31. Is the system's method of operation easily understood by employees/users? (Y)

32. Does the technology -- in good operational times -- encourage managerial response of any kind? (N)

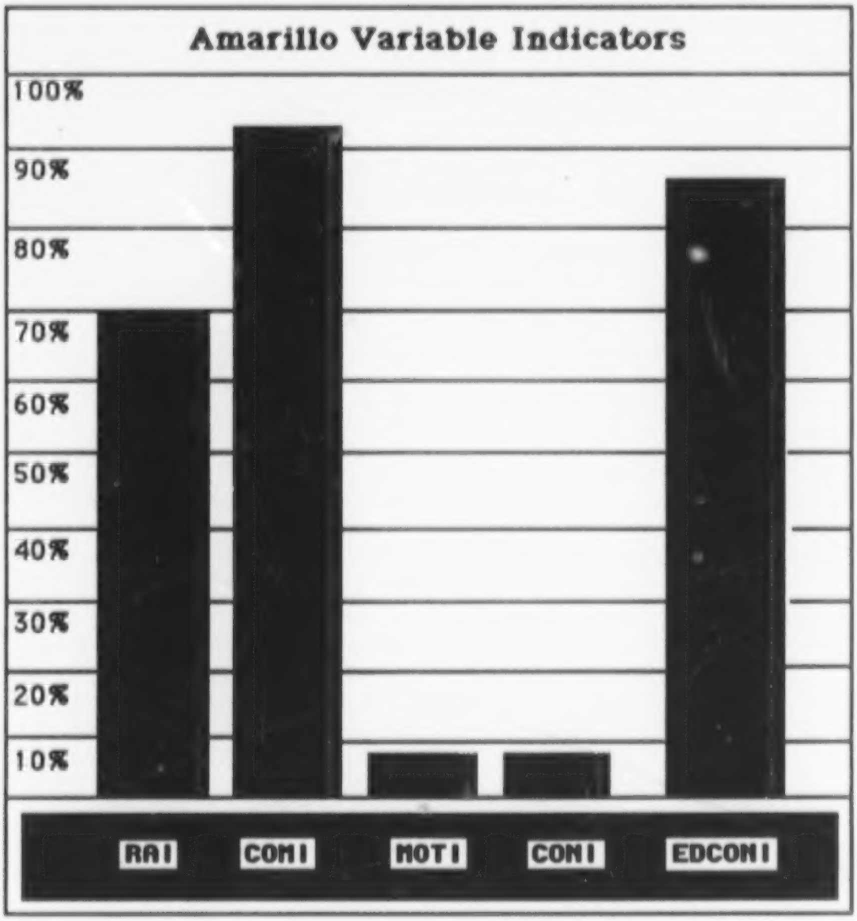
Editorial Content Operational Indicators

*1. Do managers have more time to devote to the product since the technology was adopted? (Y)
*2. Do managers spend more time on strategic planning of any kind since the technology was adopted? (Y)
*3. Does the technology make the manager more flexible -- provide more flexibility -- in dealing with content? (Y)
*4. Does the manager's control/involvement over/with content increase with the technology? (Y)
*5. Are changes in the product easier for managers to make because of the technology? (Y)
*6. Are changes in the product easier for employees/users to make because of the technology? (Y)
*7. Are deadlines more attainable because of the technology? (Y)
*8. Do managers believe the quality of writing has improved because of the technology? (Y)
*9. Do employees/users believe the quality of writing has improved because of the technology? (Y)
*10. Does the technology aid the reporting process? (Y)
*11. Does the technology aid the composing process? (Y)
*12. Does the technology aid in the accuracy of content? (Y)
*13. Does the technology aid in the content fairness that the organization attempts? (Y)
*14. Does the technology aid in the addition of perspectives to the content? (Y)
*15. Does the technology give employees/users more time for task preparation? (N)
*16. Does the technology aid the organization of content? (Y)
17. Are journalistic concerns abridged in any way by the technology? (N)
*18. Does the technology aid in the publication of late news items? (Y)
19. Does the technology prohibit any publication of any kinds of news? (N)
20. Does the technology encourage libel risks? (N)
*21. Are routine writing tasks facilitated by the technology? (Y)
*22. Are news (production) routines facilitated by the technology? (Y)
*23. Does the technology enhance objectivity? (Y)
*24. Does the technology enhance creativity? (Y)
*25. Do managers believe that content profits from the technology? (Y)
*26. Does the technology increase the information supply of the newspaper? (Y)
*27. Does the technology make adequate use of employees'/users' journalistic skills? (Y)
*28. Does the technology help the newspaper to offer any content not available through other media? (N)
*29. Does the technology permit the newspaper to go into more depth on stories than previous technologies allowed? (Y)
30. Does the technology enhance any other content more than it does the editorial content? (N)
*31. Does the technology facilitate the use of color or informational graphics? (N)
*32. Does the technology enhance audience feedback regarding content? (N)

The scores in this case were: RAI, 70.4%; COMI, 92.6%; MOTI, 9.4%; and CONI, 9.4% (all scores appear in Figure 6.3). The Amarillo case appears to be a classic textbook example in how to implement a new technology. The PCs' relative advantage compared to the previous technology is unmistakable, a fact confirmed by the relatively high index score for that variable. In terms of flexibility, efficiency and design, the Amarillo newspaper's PC system could be considered successful. Although managerial productivity doesn't seem to be significantly enhanced, that is somewhat offset by employee productivity gains.

The scenario is the same in terms of the compatibility score (92.6%). *Globe-News* personal computers are nearly perfectly compatible with what management and employee/users expected and

Figure 6.3



RAI - relative advantage index
COMI - compatibility index
MOTI - motivation index
CONI - control index
EDCONI - editorial content index

needed in a word processing technology. The machines' only deficiency is that, not surprisingly, they do not reduce the workload of the journalists.

As a result, motivation and control (9.4% each) are no problems for the newspaper's management, at least not where it concerns the technology. The lack of a trial run, employee consultation or improved job descriptions pale in comparison with the overwhelming positive response the personal computers have generated in the newsroom.

This study also will attempt to show that *the greater the relative advantage and compatibility, the more the newspaper's content will be perceived to have improved.* The 87.5% EDCONI score (also shown in Figure 6.3), indicates that, with respect to the relative advantage and compatibility index scores, this relationship has been confirmed in the Amarillo case.

Perhaps this relatively high score can be explained by the inherent journalistic nature of the word processor that the PC represents at the Amarillo newspaper. Editorial content, after all, is the written word and the PC provides ultra manipulation of the written word. Still, it is not the technology that manipulates so much; rather, it is the software that enables the technology to perform in the manner that it does. And software is designed and determined by management to a large extent. So perhaps what has happened at Amarillo -- in terms of editorial content, motivation and control -- is a case of skillful management of the technology. It is unlikely that such positive implementation could be the result of luck alone.

Theory and Summary

Several observations can be made about the Amarillo PC system within the theoretical implications discussed earlier.

First, the technology does not directly influence (if at all) organizational change although it does indirectly influence organizational behavior. The personal computers have had no observable change on the Amarillo organization other than to make its members believe they are more efficient in their approach to their jobs and to facilitate the creation of a typing pool for routine word processing chores. Therefore, any significant behavior changes are the result of attitudinal changes fostered by the technology.

Second, interaction between people and the technology affects organizational change, albeit indirectly in this case. The researcher could detect no direct organizational change other than the previously mentioned word processing crew -- a change that could be the result of a heavier workload and not just user-PC interaction.

Third, diffusion is not necessarily a manifestation of organizational change for the already-stated reasons. The PC system was "imposed" on the Amarillo newspaper by its corporate parent organization. The newspaper organization did not change -- but its word processing needs did.

Technology diffusion and use is influenced by the perceptions of those who use the technology. Again, this is only partly true because of the corporate parent taking away any local prerogatives in the matter. Still, PC use has been aided in the Amarillo newsroom by enthusiastic, teaching managers and editors, thus showing that management influences the rate of diffusion.

Finally, task and compatibility definitely influence diffusion. Even had Morris corporate officers not made the decision for Amarillo editors, it is conceivable that -- given the limitations of the previous technology -- the Amarillo newspaper would have adopted a more efficient word processing technology, such as the PCs.

In its venture into personal computers, *The Globe-News* newsroom apparently has found happiness and success. Reporters trust the PC system, editors are enthusiastic (especially when comparing it with the system it replaced) and upper management sees it as an excellent production aid and staff motivator. The staff complains only about the occasional shortage of the machines.

Reporters see PCs as aiding their writing and reporting, giving them more flexibility and capability in both areas. Editors see it as a supreme editing tool, giving them the capability to manipulate and edit copy as never before in addition to providing them with much-valued time to do other, more pressing and usually ignored duties such as planning, motivating and evaluating their staffs.

The machines interfere in reporter-editor interactions as little as possible, making themselves visible only when they "crash" or malfunction in some -- usually -- small or insignificant way.

In contrast to Amarillo's bleak economy and its oasis-like nature in comparison to the rest of the Panhandle, *The Globe-News*' PC system has become a bonus for its older and younger staff members alike. As a result, they see themselves doing a better job and publishing a better newspaper than before. It is difficult to disagree with them.

CHAPTER SEVEN

FINDINGS, GENERALIZATIONS AND PATTERNS

Analysis

The analysis of the case study evidence presented here follows several paths. In order, the researchers will discuss theoretical patterns that occurred, results across cases in relation to the stated relationships and specific case explanations. A summary of these analyses follows.

Theoretical Patterns

In discussing the theoretical implications of the technology literature (refer to Chapter Two), the researchers identified eight such implications. Except for two obvious implications (i.e., that different technologies have different impacts and that people affect organizational change), a discussion of the six more pertinent implications follows.

(1) *Technology influences organizational change and thus organizational behavior*. The study questioned the generalizability of this statement, exemplified in the Fort Worth and Beaumont cases but not as apparent in the Amarillo case.

Videotex and pagination necessitated some organizational change, which in turn changed some employees' behavior in comparison to previously accepted behavior. For example, the editorial staff of the videotex operation actually is a copy editing staff; pagination, meanwhile, added composing room duties to the previous responsibilities of the Beaumont copy editor, but little changed in Amarillo with the personal computer network.

(2) *Interaction between people and the technology has affected organizational change*. All three cases evidenced this axiom.

In Beaumont, negative experiences with pagination terminals and the shortages of those terminals led to a reorganization of copy editing staff work schedules. In Fort Worth, the differences between videotex operations and traditional newsroom processes necessitated a new division within the newspaper hierarchy. In Amarillo, personal computers' performance helped create a non-journalistic word processing staff.

(3) *Management influences the rate of the technology's diffusion*. This seemed obvious in each case. The decision -- in and of itself -- to implement the technology spoke of management's influence. But beyond the initial decision, managerial influence varied in directness, intensity and impact.

For example, management had a more direct and forceful hand in the diffusion of videotex because the technology provides immediate feedback. When customers were dissatisfied with the product or the service, Startext managers knew so fairly quickly and were able to effect an immediate change.

In Amarillo, management's diffusion influence largely came with the management-led training sessions on the personal computers and continued on a smaller scale through one-on-one technical advice. Beaumont, on the other hand, experienced management influence daily in the continual task of page layout and editing.

(4) *Job task and its compatibility with the technology influence the technology's diffusion*. Except for the Fort Worth videotex case -- in which videotex diffusion was more influenced by management's reaction to consumer concerns -- the technology-task compatibility widely influenced the employee/user decision to readily adopt the technology. Nowhere was this more evident than in Beaumont, where pagination almost redefined the nature of the copy editor's task.

(5) *Technology is a manifestation of organizational change*. It often was difficult, in the three cases studied, to detect whether organizational change preceded or followed the technology. It also was difficult to detect the form of "organizational change."

In two cases -- Beaumont and Amarillo -- the technology was somewhat "imposed" on the organization by upper management decision-making. Considering those decisions as "organizational change" probably stretches the definition of the term.

Only in the Fort Worth videotex operation could one safely and confidently say that the technology symbolized an organizational change because videotex is such a radically different operation -- in addition to being an entirely new medium -- than a regular newspaper that the decision to implement a videotex system was a relatively major organizational change.

(6) *Technology diffusion and use is influenced by those who use the technology* -- a statement this study found not uniformly true.

Nowhere was this statement more in evidence than in the Amarillo case, in which managers' need to know how to operate the technology in order to personally train employees made management a strong proponent of the technology.

The opposite situation existed in Beaumont, site of more vocal complaints about the pagination system among managers and, as a result, among the employee/users. In Fort Worth, employees had little influence over videotex diffusion while consumers had the most say.

In summary, then, the theoretical implications usually but do not always pertain uniformly to each case nor in each situation within cases. The exceptions generally are due to such factors as *the nature of the technology* and *the involvement of management*.

For example, the nature of videotex in conjunction with the issue of diffusion takes much of the issue out of the organizational sphere (i.e., there is no "diffusion" per se among employees) and into the marketing/consumer area, where strategic management decisions and reactions are of utmost importance. The nature of pagination, on the other hand, means that management involvement will much more consistently influence diffusion because of the technology's daily and pervasive use on the news desk.

Relationships and Across-Case Results

This study examined each case to determine the applicabiliity of two relationships:

(1) *The greater the relative advantage and compatibility of a technology, the less likely will the manager need to pursue motivational and controlling measures in getting subordinates to adopt the technology and (2) The greater the relative advantage and compatibility, the more the news-editorial product will be perceived to have improved.*

Figure 7.1 details the relationship between relative advantage and: the need to pursue motivational measures; the need to pursue controlling measures and the perceived news-editorial product quality. The three graphs plot the nature of each relationship when all three case studies simultaneously are examined.

Comparing relative advantage to motivation, the illustration shows no distinct, direct or linear pattern. That is, when the relative advantage index (RAI) score increases -- from the low in Beaumont to a higher score in Fort Worth -- the motivation index (MOTI) score also slightly increases. But an even higher relative advantage score in Amarillo yielded a correspondingly *lower* motivation score.

Had there been a directly inverse relationship, as had been predicted, the Fort Worth motivation score would have been lower than Amarillo and higher than Beaumont. In short, it appears that increased technological relative advantage alone does not lead to a decreased need for staff motivation. But it does appear that the degree of need may decrease more rapidly after a certain point, as represented by the Fort Worth relative advantage score.

In comparing relative advantage to control, the illustration shows a somewhat more definite relationship. For example, when the relative advantage score increases the control index score slightly decreases.

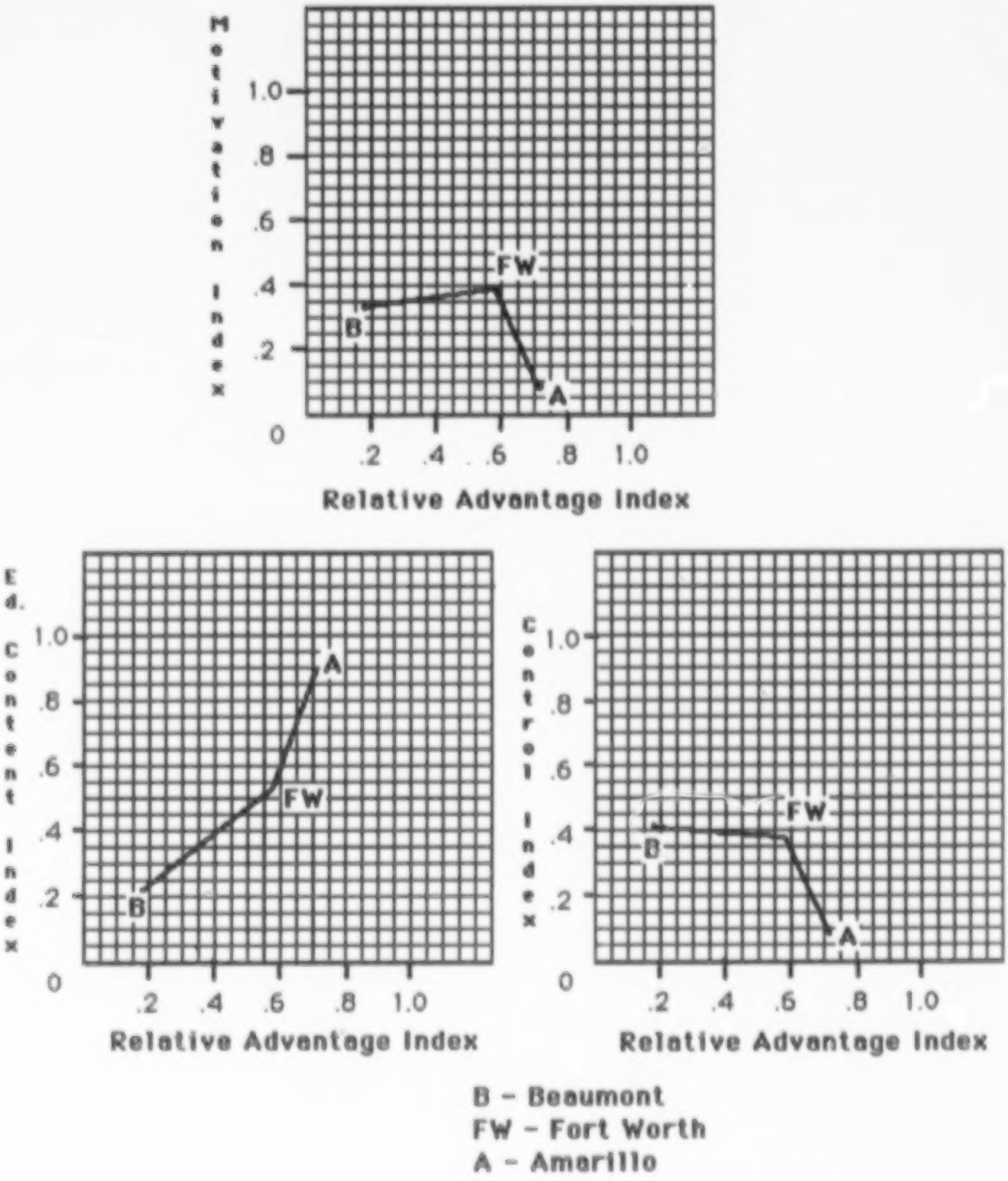
These results are somewhat more in line with the first relationship predicted. That is, it does appear that increased technological relative advantage has some bearing on -- at face examination, it lessens -- the need for managerial control. It also appears that the degree of need may decrease more rapidly after a certain point, as represented by the Fort Worth relative advantage score.

When relative advantage is compared to editorial content, the illustration reveals a *still more* definite relationship. That is, when the relative advantage score increases the editorial content index score also increases, as had been predicted by the second statement.

In short, it appears that as the technology's relative advantage increases, so too does the perception that the news-editorial product has been enhanced. In conjunction, it also appears that the

Figure 7.1

Across-Case Results of Relative Advantage as a Predictor



degree of perception may increase more rapidly after a certain point, as represented by the Fort Worth relative advantage score.

The graphs in Figure 7.2 detail the second aspect of the study's attempt to show the relationship between compatibility and: the need to pursue motivational measures; the need to pursue controlling measures and the perceived news-editorial product quality. The three graphs plot the nature of each relationship and present a striking contrast to the relative advantage graphs.

Comparing compatibility to motivation reveals an inverse relationship. That is, as compatibility increases, the need for motivation decreases across the cases. The compatibility index scores range from a low in Fort Worth to the highest score in Amarillo, while the motivation scores show the reverse. The reader will recall that no such similar relationship was found for the relative advantage-motivation comparison.

In comparing compatibility with control, however, no distinct relationship was found. As the compatibility score increased -- from the relatively low Fort Worth score to a higher Beaumont score -- the control score *also increased*. But a *still higher* compatibility score in Amarillo was paired with the lowest control score. In short, it does not appear that increased technological compatibility alone leads to a decreased need for staff control. But it does appear that the degree of need for control may decrease more rapidly after a certain point, as represented by the Beaumont compatibility score. The reader also will recall that the relative advantage-control comparison *did* yield a somewhat limited inverse relationship.

Comparing compatibility to the perception of product editorial quality appears to yield no direct relationship between the two. When the compatibility score increases (from Fort Worth's relatively low score to a higher score in Beaumont), the corresponding editorial content score *declines* . But a still higher compatibility score in Amarillo reveals the highest editorial content score of the three cases.

In short, it does not appear that increased technological compatibility alone leads to an increased perception of editorial quality. The reader will recall, however, that a direct relationship *was* found between perception of editorial quality and relative advantage.

Finally, Figure 7.3 fully details the study's attempts to show the relationships of relative advantage *and* compatibility among: the need to pursue motivational measures; the need to pursue controlling measures and the perceived news-editorial product quality.

Comparing relative advantage and compatibility with motivation yields no direct relationship. That is, when the average relative advantage-compatibility score increases, the corresponding motivation score does not consistently decrease, as the researcher had predicted.

Therefore, it does not appear that increased technological relative advantage and compatibility lead to a decreased need for staff motivation. Still, the graph indicates that the degree of need decreases after a certain level, as exemplified by the Fort Worth relative advantage-compatibility score.

Comparing relative advantage and compatibility with control, however, *does* yield a direct relationship. That is, when the relative advantage-compatibility score increases, the corresponding control score decreases. The reader will recall that a somewhat lesser inverse relationship was discovered when relative advantage alone was compared to control while no such relationship was found when compatibility alone was considered. It appears, then, that increased technological relative advantage *and* compatibility do help lead to a decreased need for staff control.

Comparing relative advantage and compatibility with editorial content also appears to yield the relationship -- that is, when the relative advantage-compatibility score increases, so, too, does the editorial content score. Therefore, it appears that increased technological relative advantage *and* compatibility do help lead to an increased perception of editorial quality. The reader will recall, however, that when compatiblity alone was considered, no such relationship was found.

In summary, three general comments can be made concerning the independent variables examined by this study:

1) *Technological compatibility appears to be a more pertinent variable than does relative advantage in predicting the need for staff motivation.* When paired together, still no definite relationship surfaces and relative advantage appears to be the "stronger" of the two -- the nature of the relationship (i.e., the shape of the curve) tends to reflect the same general nature as when only relative advantage is considered.

Figure 7.2

Across-Case Results of Compatibility as a Predictor

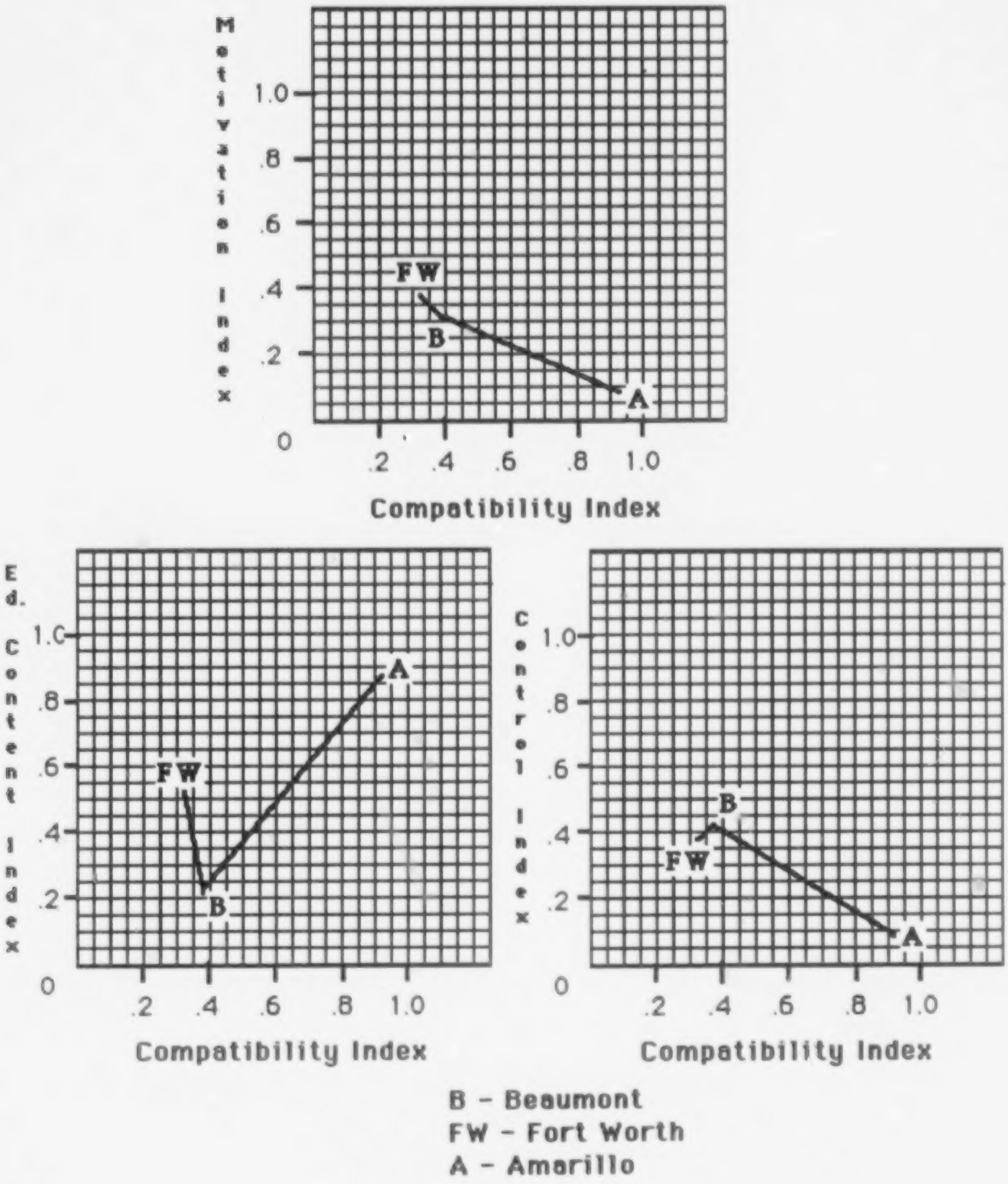
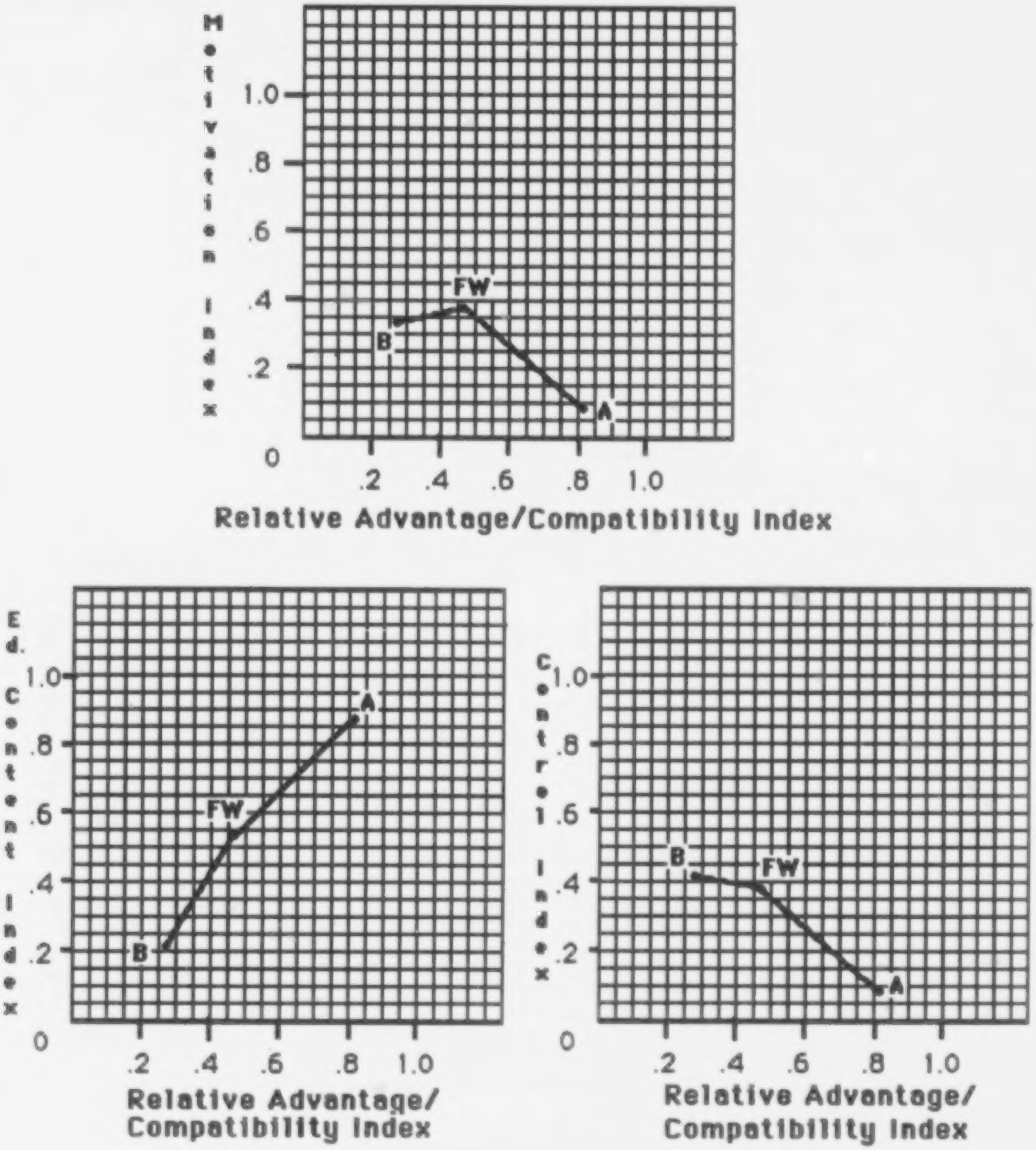


Figure 7.3

Across-Case Results of Relative Advantage and Compatibility as a Predictor



B - Beaumont
FW - Fort Worth
A - Amarillo

2) *Technological relative advantage and compatiblity, when combined, appear to be more suitable predictors of the need for staff control* than when either is considered separately, although relative advantage seems to be the more suitable of the two in a head-to-head comparison.

3) *Technological relative advantage -- either alone or when combined with compatiblity -- appears to be a more pertinent predictor of the perception of product news-editorial quality* than when compatibility alone is considered.

Finally, these results also can be examined via other perspectives. As the first general comment indicates, compatibility seems to be a more suitable variable than relative advantage in predicting motivation levels. The reasons may vary, but a principal factor could reside in the fact that compatibility is a more task-oriented value than relative advantage.

That is, measuring compatibility necessitates direct comparisons of the technology with job tasks. Measuring relative advantage, on the other hand, is more concerned with comparisons with previous technologies -- hardware to hardware, so to speak. In short, compatibility is the more human variable of the two and thus more directly seen in motivation measurements.

In regard to relative advantage and compatibitility seeming to be more suitable variables in predicting the need for staff control when combined than when considered separately, a major reason could be that control is a combination of monitoring the technology's performance as well as employee reaction to that performance. It would not seem logical to differentiate the two to the manager.

It is difficult to explain why the perception of technological effect on news-editorial content seems to be more related to relative advantage than to compatibility. It could be that the technology -- the tool -- is the sole variant. That is, compatibility may only gauge expectations while relative advantage -- a new technology -- has a hands-on, practical effect on the product.

Specific Case Explanations

In light of the analyses above, some additional generalizations can be made about each case.

(1) Fort Worth. *The Star-Telegram* videotex operation is a small unit, when compared to the other cases. It could also be described as the most cohesive of the three. As a result, one would expect a relatively higher degree of staff motivation as the researcher found.

Those elements, however, make the operation's motivation index score surprising. At face value, it appeared that the videotex operation needed more motivational management than the other two cases.

However, one also must consider theoretical implications. In a videotex organization, job task and the technology's compatibility with that task have little influence on the technology's diffusion. In other words, although the technology is not compatible with what most journalists consider as their job, that fact does not have anything to do with whether consumers use the product.

Journalists usually like to have some impact on the product's use to the consumer. But videotex places much of that impact in management's hands. This disparity between reality and journalistic tradition appears to account for the heightened necessity of motivation at an organization that already seems highly motivated. Therefore, the lack of compatibility with that tradition necessitates increased management attention to motivation.

Insofar as videotex's relative advantage at Fort Worth, one could say that Startext's relative advantage score was misleading from the standpoint that videotex is more than a technology; it is a medium unto itself. Therefore, it represents more than just an additional publishing tool. It is a radical technological departure allowing the newspaper organization to become multi-(medium)-dimensional; i.e., creating two mediums under one umbrella organization.

The comparatively strong relative advantage showing exists in the fact that adopting videotex represents a corporate diversification of a type for a newspaper. Not only is the organization repackaging the newspaper; it's also creating an entirely new product with progressively fewer and fewer of the traits (i.e., information) that a traditional newspaper provides and, offering instead, "services."

(2) Beaumont. At *The Enterprise*, page layout terminals created a paradox of a sort.

For a technology supposedly economic-intensive, the Beaumont PLTs have a surprisingly low relative advantage score. One would expect that pagination's potential for time, labor and cost savings would make it the supreme technology in terms of relative advantage. That, however, has not been the case in Beaumont. Not only is the relative advantage index score low, so is the motivation index score.

Copy editors did not seem totally happy with the technology, to be expected given the system's reported inconsistency. But this unhappiness did not seem a problem, partly due to the professionalism of the copy editors. More significantly, however, management -- as well as employees -- frequently used the system and was aware of its shortcomings.

Managers also expressed misgivings about the system. Employees were aware of such misgivings and they consistently rated their managers as competent persons for whom it is not difficult to work. Those factors seemed to have mitigated the need for increased motivation.

Also, in terms of compatibility, the pagination system had double its value in terms of relative advantage. No one at Beaumont believed the pagination system difficult to learn. Copy editors unanimously agreed that the system saved time, money and effort in most areas in addition to providing added control over the design of the product. Indeed, Figure 7.2 indicates that Beaumont's motivation index score is lower when compared to an organization with a lower compatibility index score.

On the other hand, the perception of the Beaumont news-editorial product's quality is not as great as the other two cases -- especially surprising because an organization with a lower compatibility index score has a higher editorial content index score (again see Figure 7.2). One explanation could be that pagination, as an instrument of design control, works to the extent that non-design-oriented content (i.e., text) gets "lost" or loses a little emphasis in the effort to make a visually appealing product.

The final Beaumont irony lies in its control index score as compared to its compatibilty score (again, Figure 7.2). The researchers' predictions indicate that the control score of Beaumont should be lower than that of Fort Worth. The fact that the opposite is true is initially puzzling since pagination attempts increased managerial control and, therefore, less control should be needed once the technology is adopted.

But closer inspection reveals that increased product control creates organizational changes and concurrent problems in handling those changes. At *The Enterprise*, those changes came via reorganization and increased responsibilities for copy editors. In other words, control in one area led to problems and the need for more control in another area and increased technological compatibility alone does not lead to increased control.

(3) Amarillo. *The Globe-News*, again, appeared to be the ideal in nearly every respect save one. Perhaps the only problem, if it could be so described, may be that Amarillo represents an extreme case, a non-representative instance in which the technology so completely matched the organization that no problems existed to analyze.

Some would perhaps wonder whether some spurious phenomena occurred. For example, newspapers probably know more about word processing technology than about any other technology because that is the tool with which newspapers have the most experience. That conclusion about spuriousness, however, would be short-sighted.

Comparing *The Globe-News* results to themselves, the motivation and control indices were exactly the same, although the relative advantage and compatibility indices differed. Why the same level of result in the dependent variables from such different levels of independent variables?

The disparity may arise from the fact that both technologies did the same task -- allow users to manipulate text. The important difference is in how -- i.e., compatibility with existing tasks -- this manipulation was achieved. Thus, relatively speaking, the relative advantage is not as great as the compatibility.

But as to how the two variables could help determine the same level in the dependent variable scores, it could be that the motivation and control are functions of compatibility and relative advantage only to a certain extent. For example, one could predict that after compatibility reaches a certain level or "saturation point" (in this case, 70.4 percent on the index), some other variable or variables affect the needed level of motivation and control.

In Amarillo, this variable or these variables could take various forms. Recall that, in reviewing the theoretical implications, Amarillo's technology was contradictory. Whereas generally technology is a manifestation of organizational change, that was not the case in Amarillo. The technology was imposed on the Amarillo organization by its corporate parent. Perhaps this may have affected perceptions of the PCs' relative advantage or compatibility. Perhaps not. This question needs more study.

Summary

This study began examining the impact of technology on newspaper management. In so doing, the study design has focused on the relationship between technological compatibility, relative advantage and managerial need for motivation and control as well as the impact on perceptions of news-editorial content. Various perspectives have been used to reach varying conclusions.

In one context, traditional theoretical implications usually but do not always pertain uniformly to each case nor in each situation within cases. That is, management and user-technology interaction play a large part in the technology's adoption and the processes surrounding that adoption, but exceptions occur. The exceptions generally arise from such factors as the nature of the technology and the degree of management's involvement.

For example, videotex by nature takes much of the diffusion issue out of the organizational sphere (i.e., there is no "diffusion" per se among employees) and into the marketing area, where strategic management decisions and reactions become important. Pagination's nature, in addition, means that management will be much more consistently involved in diffusion because of pagination's daily and pervasive use.

From the study's predictions, three general comments can be made concerning the study's independent variables:

1) Technological compatibility appears to be a more pertinent variable than does relative advantage in predicting the need for staff motivation. When relative advantage and compatibility are paired, still no definite relationship between the two and motivation surfaces and relative advantage appears to be the "stronger" of the two -- i.e., there is no relationship, as is the case when only relative advantage is considered.

2) Technological relative advantage and compatiblity, *when combined*, appear to be more suitable predictors of the need for staff control than when either is considered separately, although relative advantage seems to be the more suitable of the two in a head-to-head comparison.

3) Technological relative advantage -- alone or combined with compatiblity -- appears to be a more pertinent predictor of the perception of product news-editorial quality than compatibility alone. Looking at the specific cases, several generalizations can be made:

- Videotex takes away certain motivational "powers" away from journalists.
- Videotex represents a strong relative advantage in that it is a form of diversification for newspapers.
- Management can overcome low technological relative advantage and thus lessen the need for motivation.
- Pagination's relatively high compatibility lessens the need for motivation.
- "Over-control," i.e., pagination's over-emphasis on visual layout control, may lead to the de-emphasis of content of text.
- Organizational changes (in reaction to the technology) lead to an increased need for control.
- Technological compatibility may reach a "saturation point" beyond which it has little cumulative effect on the need for motivation or control.
- Ideal technological implementation is attainable. In the next chapter, the researchers will discuss what conclusions can be drawn.

CHAPTER EIGHT

SUMMARY AND CONCLUSIONS

Implications

Several conclusions can be drawn from a summary of the case study evidence:

- *Technology creates a variety of impacts: managerial, journalistic, environmental and cumulative.* Each impact differs according to the circumstances -- specifically, the type of technology, the reaction and resources of the organization, the nature of the journalistic task involved and, probably most important, the functions and capabilities of the technology.
- *A technology's varying functions correlate with varying results.* More specifically, it appears that neither relative advantage nor compatibility consistently correlates with the need for motivation and control or the perception of product news-editorial quality in each case.
- *The technology-employee-management-environment theoretical quadrangle must be refined if it is to apply in this situation.* The present study has shown that variations and subvariations of each element need to be examined in greater depth.
- *The nature of the technology and management's response and initiative in reacting to the technology help determine the degree to which technology adoption succeeds.*
- *The concept of motivation needs to be researched further to determine its relationship to technological attributes.* The present study suggests that motivation in the traditional sense is not solely a function of technological innovation and that other non-technological phenomena probably factor in the assessment of the need for motivation.
- *The technological variables of relative advantage and compatibility, when combined, seem to act as a type of regulatory mechanism in the area of control, whether it be operational or editorial.* The strong presence of both variables apparently serves as an "invisible editor" for the newspaper.
- *Technology changes the nature of work for the manager.*
- *Technologies change the editor's approach in dealing with certain issues, especially those related to the technologies.*
- *The technology does not always change organizational priorities.*
- *Some editors -- faced with what they view as technological "shortcomings," inadequacies or realities -- must become more adept at motivational strategies than they were prior to the technology.*
- *The technology forces -- or, at least, prompts -- editors to become better intermediate-range planners.*
- *In general, technology has no adverse effect on editor-reporter or editor-copy editor relations.*
- *The technology gives greater control over some aspects of the product than it gives over others.*
- *The technology nearly always makes the editor a better recruiter.*
- *Managers as a group have to learn to become more flexible, thanks to the additional work that technologies have created.*
- *A majority of those interviewed -- especially managers -- viewed the technology as basically a technical concern*, i.e., "what can the machine do *for* us" rather than the sociological or communications-related perspective of "what can the machine do *to* us."

In order, the researchers will discuss technological impact, theory, methodological concerns, implications for newspapers and the original questions of the study as each is answered by the study findings.

Impact

This study began examining the impact of technology on newspaper management. In the three cases studied, the impact has obviously varied since three different technologies were examined. Perhaps the best method to gauge impact involves taking each technology individually.

It appears that pagination may be one of the more volatile technologies in the newspaper industry. "Volatile" in this sense means that, if this study's results are to be believed, pagination necessitates more intermediate management and planning and can cause more managerial problems than the other two technologies. Pagination's impact may be more pervasive in terms of organizational and motivational concerns of the manager -- despite the healthy relative advantage and compatibility it enjoys with the job of the copy editor.

At the opposite end, personal computers seem to warrant little, if any, managerial attention when appropriate planning and testing have been attempted with some degree of success. Personal computers also pose no threat to changing the job of reporters in the way that pagination seems to have been perceived by copy editors.

The middle ground -- on which videotex lies -- is somewhat more difficult to analyze, partly because it is in the middle and partly because its function in Fort Worth substantively differed from the other two technologies studied. Unlike personal computers and pagination, videotex is not a management *tool*.

Videotex does not -- as most technologies do -- take "input" and transform it into "output" in the traditional sense. Rather, videotex (i.e., the service) *is* the output, changing the management-technology relationship altogether. Instead of management driving the technology, technology drives management -- at least until management attains a thorough understanding of the technology and its appeal. In Fort Worth, management -- by its own admission -- has not yet reached the latter stage. The technology also is new enough so that it carries some impact on editorial content perception as well as on the managerial realm -- thus making its cumulative impact greater than a more familiar and successful technology such as the personal computer.

Success of implementation also probably is a barometer of impact. No one at the Beaumont or Fort Worth operations would go so far as to place the implementation of their technologies on the same point on the diffusion curve as the personal computers in Amarillo. Management, in technological planning, always aims toward making the technology "invisible," i.e., implementing it to the point where it is no longer unusually noticeable in daily operations. Of the three cases, Amarillo seems to have come closest to that goal. Such success does not necessitate much managerial energy -- meaning a lesser cumulative impact.

Another aspect of impact involves adaptation to the technology. The motivation and control index scores -- as well as the compatibility scores -- mentioned and analyzed in previous chapters indicated such adaptation to a large extent. Amarillo's scores in these areas reveal a high degree of employee adaptation to the technology, while Beaumont's and Fort Worth's scores show a lesser degree of adaptation. The lesser the degree of adaptability, the greater the cumulative effect.

In addition, the relative impact of technologies also evidenced itself in the nature of work that the technologies require. A change in the traditional work routine or in the task's requirements will necessarily require more managerial motivation and control -- and thus produce a greater degree of cumulative impact. Videotex obviously transformed the jobs of the newspaper manager (i.e., the general manager) and of his editorial staff in much the same way that pagination affected the copy desk: The nature of work changed, requiring adaptations of some kind. But personal computers did not significantly change the Amarillo reporters' jobs nor those of the editors.

Finally, one must consider the much larger context of the newspaper environment when discussing technological impact. When a newspaper's corporate parent orders the adoption of a technology without consulting those affected, the newspaper employees' attitudes definitely are adversely influenced. This was overcome in Amarillo, however, with the selection of an appealing and effective technology. When a newspaper's executives order the adoption of a technology without consulting those affected, the newspaper employees' attitudes again are adversely influenced. This effect was not completely overcome in Beaumont, primarily because of the technology and also because of its less-than-perfect performance. The technology's performance makes the difference.

Other environmental impact factors involve the internal organizational social system and economic concerns. In the Fort Worth case, the Startext organization is a small, cohesive unit driven to make the technology appealing to consumers. But cohesiveness often is a function of size, which, in this case, may be a function of subscriber levels. It could be argued, however, that the Startext services do not directly hinge on the staff size, but rather the quality of staff work. Therefore, it would be difficult to assess the causal nature or the source of the impact in this case, although it probably would be more correct to say that the technology drives the system via other factors such as motivation.

In the Beaumont case, the social system's structure is a direct outgrowth of the function of the pagination technology. Copy desk organization must revolve around the machine's availability in order to attain efficient PLT use. Simultaneously, such organization also determines the level and intensity of PLT use. Again, assessing causal impact remains difficult but, also again, it probably would be more correct to say that pagination drives the environment rather than the reverse.

No such difficulty in determining impact, however, arises in Amarillo. The technology reigns supreme, i.e., personal computers -- usually shared by reporters and editors -- often are in demand and staff personnel schedule their duties around PC availability. In addition, the PCs' word processing capabilities have created a kind of division of labor among newsroom personnel so that routine, repetitive functions have necessitated the creation of a clerk bank while the creative functions remain in the reporters' realm of duties.

Taking the three cases as a group, then, a circular relationship exists between the technology and the social environment, i.e., each influences the other. But the relationship could also be technology-driven, since the technology creates an impact via the reaction it stimulates within the social system. The social system, in turn, affects the rate of adoption via the aforementioned reaction.

In contrast, each case technology ultimately was the product of an economic decision by newspaper executives and corporate officials. Goals, objectives and plans all predated the purchase of each technology and all were based on economic considerations that considered costs, labor savings, production efficiency and continued company profits. Videotex, within a narrow framework, could be considered the lone exception because of its experimental status. But videotex, too, ultimately must prove to be a money-making operation in order to continue.

In summary, the technology creates a variety of impacts: managerial, journalistic, environmental and cumulative. Each impact differs according to the circumstances -- specifically, the type of technology, the reaction and resources of the organization, the nature of the journalistic task involved and, probably most important, the functions and capabilities of the technology.

Theory

In Chapter Seven, the researchers discussed the study's evidence in light of the theoretical implications of previous research. These implications usually -- but not always -- pertained uniformly to each case. Exceptions generally were due to such factors as *the nature of the technology and the involvement of management*. Perhaps progress has been made in the search for more pertinent variables in diffusion studies.

To understand these exceptions, it also would be helpful to examine the three general comments about the independent variables and (in parentheses) a plausible explanation for each generality:

1) Technological compatibility appears to be a more pertinent variable in these three cases than does relative advantage in predicting the need for staff motivation. (Compatibility is a more task-oriented value than relative advantage.)

2) Technological relative advantage and compatibility, *when combined*, appear to be more suitable predictors of the need for staff control than when either is considered separately. (Control is a combination of monitoring the technology's performance as well as employee reaction to that performance. It would not seem logical to the manager to differentiate the two.)

3) Technological relative advantage -- alone or combined with compatibility -- appears to be a more pertinent predictor of the perception of product news-editorial quality than compatibility alone. (Compatibility may only gauge expectations while relative advantage -- a new technology -- has a hands-on, practical effect on the product.)

The obvious, general conclusion from these comments is that a technology's varying functions correlate with varying results. More specifically, *it appears that neither relative advantage nor compatibility consistently correlates with the need for motivation and control or the perception of product news-editorial quality in each case.*

Other research findings -- involving such factors as organizational roles, technology complexibility, job design, task certainty and user needs -- provide additional perspective in that they place this study across the spectrum of previous research typologies.

In Chapter Two, the researchers examined the theoretical implications from varying approaches. The researchers concluded that a theoretical approach along the lines presented by Eason[1] might be more appropriate. Eason proposed a framework viewing technology adoption as a product of the interaction of environment/system, task and user, all of which then feed into the user's response to each task episode. The technological system was seen as the principal independent variable but its usability depended on task and user variables. The three variables came together to provide the context in which the user made his judgment as to how to proceed with a specific task. The present study helped determine the degree of impact of management, employee, technology and the environment, achieving greater clarification via a focus on the management process and on technology attributes.

Given this brief analysis and considering the general comments, one must return to the study's exceptions to the theoretical implications: the nature of the technology and the involvement of management.

First, "the nature of the technology" in this case can be examined from two perspectives: internal and external. "Internal" implies that each technology has certain unique, inherent attributes that affect its rate of diffusion. This compares to Rogers' attributes[2] (compatibility, complexibility, relative advantage, trialability and observability) or those of Downs and Mohr[3] (primary and secondary). "External" implies the technology itself, its function as a tool, *the specific task* it is designed to accomplish.

In theoretical terms, this classification enables the researcher to distinguish the technology's function from the perceptions of the technology's characteristics. As Lancaster and Taylor argued,[4] there has been relatively little diffusion research relating the differences among innovations. They reasoned that the potential adopters' perception of the attributes of an innovation may be the most important dimension in relation to the rate of adoption. The "external" and "internal" technological dimensions suggested here may help fill this gap in the literature.

Second, "the involvement of management" in this case refers to the concept of *the degree to which management uses its authority and influence to speed and facilitate the adoption of the technology*. Various examples from the present study illustrate this concept.

In Amarillo -- contrary to the theoretical given that technology influences organizational change and thus organizational behavior -- *The Globe-News* management took upon itself the task of learning the complexities of the personal computer system to train those who would use the technology the most: reporters. As a result, little organizational change and few instances of significant, new behavior occurred.

Another general theoretical axiom stipulates that job task and its compatibility with the technology influence the technology's diffusion. While this generally holds true, the Startext management had a much larger role to play in the videotex system's diffusion than any one job-technology compatibility factor -- largely because videotex is not an organizational tool but, rather, a product. And Startext management's response to consumer concerns -- either by considering consumer suggestions or rectifying system problems -- played a large part in whether subscribers remained loyal.

Still another theoretical generalization implies that technology is a manifestation of organizational change. In Beaumont, however, instead of the pagination layout terminal functions manifesting any changes in *Enterprise* news desk staff organization, the organizational changes were made by management to accommodate the technology. In essence, *management decided to accommodate the staff via accommodating the technology*, i.e., staff schedules were changed to make more efficient use of the pagination terminals.

In each of the above examples, then, management intervened in some form or method. *These interventions, however, are distinguished by the direction of management's choice: to accommodate the staff (user), to accommodate the consumer (user), or to accommodate the technology*. The choice of user vs. technology becomes more interesting in light of the evidence reported in Chapter Seven: the Amarillo technology obviously was more widely accepted in terms of its target audience. One wonders what would have happened had staff accommodation been the consistent goal in each case. It is important to remember, however, that the nature of the technology also played a large part in these decisions.

Returning to the general comments concerning the present study's variables, several more theory-related improvements suggest themselves. For example, the first comment -- technological compatibility appears to be a more pertinent variable than does relative advantage in predicting the need for staff motivation -- suggests not only that compatibility may be a more task-oriented value than relative advantage, but also that staff motivation is a more complex variable than initially believed.

The researchers consistently discovered that employee motivation also depended on managerial *ability* to motivate -- regardless of the technology in place -- as well as on general employee attitudes and receptivity toward motivation. In future studies, it might help to distinguish among these factors as well as to re-test the role of relative advantage.

The second comment -- that technological relative advantage and compatibility, *when combined*, appear to be more suitable predictors of the need for staff control than when either is considered separately -- possibly suggests two rationales: (1) Control is a combination of monitoring the technology's performance as well as employee reaction to that performance. It would not seem logical to the manager to differentiate the two; and (2) Perhaps compatibility and relative advantage constitute some new or as-yet-undescribed phenomenon when combined. Various classification approaches exist, but with control as the dependent variable in this instance, one could use a relative term, such as "regulator," "control device," or "thermostat." That is, compatibility and relative advantage act in tandem as technological thermostat for management when it comes to assessing the need for control.

The third generality -- that technological relative advantage (alone or combined with compatibility) appears to be a more pertinent predictor of the perception of product news-editorial quality than does compatibility alone -- suggests that although compatibility is a more task-oriented concept, it may only gauge expectations while a new technology has a hands-on, practical effect (i.e., relative advantage) on the product. Also, the relative advantage-compatibility tandem seems again to be at work.

Does the "thermostat" label apply toward editorial content? Perhaps, but probably not in terms of control; rather, the tandem could be considered in the perspective of "quality control." As that term is defined, it does not lend itself to the "thermostat" imagery. Instead, one could consider this phenomenon to be more along the lines of an added safeguard or, in the newsroom jargon, an invisible or semi-invisible "editor" who assures a quality product. So one could say that the technology serves an "editing" function as well in the combined degree of relative advantage and compatibility that the technology achieves.

Examining the three generalizations as a group, it appears that the relative advantage-compatibility tandem sufficiently predicts the factor of the necessity for control and the perception of product news-editorial quality (The labels of "thermostat" and "editor" tend to illustrate technology as a management tool). This may mean that either a more suitable predictor needs to be found for the concept of motivation or that motivation needs further dissection or more precise definition. Or it could mean that technology is not solely a motivational tool in the traditional sense.

If the latter is true, then some re-thinking needs to be done concerning the managerial functions -- if any -- affected by technology after its adoption. Perhaps, as in the Beaumont case, motivation is not the main problem as much as the problem is organizing and, to a lesser extent, staffing.

In summary, the technology-employee-management-environment theoretical quadrangle must be refined if it is to apply in this situation. The present study has shown that variations and subvariations of each element need to be examined in greater depth.

For example, exceptions must be noted for such factors as the functions and perceptions of the technology, as well as for managerial accommodations toward the technology and toward the target user group(s). The present study indicates that the nature of the technology and management's response and initiative in reacting to the technology help determine the degree to which technology adoption succeeds.

In addition, the concept of motivation needs to be researched further to determine its relationship to technological attributes. The present study suggests that motivation in the traditional sense is not solely a function of technological innovation and that other non-technological phenomena probably factor in the assessment of the need for motivation.

Finally, the technological variables of relative advantage and compatibility, when combined, seem to act as a type of regulatory mechanism in the area of control, whether it be operational or editorial. The strong presence of both variables apparently serves as an "invisible editor" for the newspaper.

Methodological Concerns

Despite this study's findings, the reader should exercise caution. Several study design considerations warrant discussion.

(1) The present study was limited to three technologies. Obviously, this inhibited unbridled generalization in certain areas. It would be difficult to generalize to the newspaper industry based solely on three case studies made by a single observer. More studies should be done to warrant such generalization. However, the technologies were purposely selected so as to produce certain desirable conditions. In addition, case studies are generalizable to theoretical propositions and not to populations or universes. In this sense, the case study -- like the experiment -- does not represent a "sample."

(2) The present study was limited to three newspapers. It would be difficult to generalize from each newsaper's experience to newspapers that use similar technologies. It would especially be difficult in this study because the participants were not randomly selected. Convenience, access and geographic proximity were given consideration. More studies need to be done in order to generalize from results to the industry.

(3) The case study method and the number of cases in this study do not lend themselves to statistical scrutiny, validation or verification. For example, the researchers interviewed participants at their convenience and with their consent. Obviously this could bias results. However, such interviews were necessary to obtain a detailed description of organizational dynamics occurring after the technology had been implemented at the participating newspapers.

In addition, the researchers' observations were obviously influenced by their personal bias, experience and judgment. This method was used, however, in order that the research issues could be examined in a natural setting and so that performance and reactions of users to the technology could be unobtrusively observed.

(4) The instrument used to gauge the independent and dependent variables was being given a trial run. Its internal validity was slightly questionable, as several items were used on more than one scale, albeit with varying phraseology and no inter-coder reliability test was performed. Also, the number of items on each scale was arbitrarily set. There is no reason not to increase or decrease the list.

In addition, the method of reporting or gauging the results gleaned from the instrument could be improved. The researchers arbitrarily chose to use percentages to indicate the relative strength of each variable, with no attempt being made to measure intensity of each item. Item weighting might improve the instrument, although the researchers felt such weights would not be particularly pertinent at this level of research and that the weighting process would be an individual exercise in judgment.

(5) Finally, this study's timing gives the researchers only a snapshot of the entire adoption process. In the interest of adding deeper perspective or context, it would be helpful to study all phases of the adoption process of each technology examined.

Newspaper Management Implications and Recommendations

A main thrust of this project involved examining the impact on newspaper managers of videotex, personal computers and pagination. As discussed above, that impact primarily was assessed in terms of the need for staff motivation and control.

Although varying levels of technological relative advantage and compatibility were somewhat related to managerial impact, analysis also revealed other management concerns.

- *Generally speaking, the technology in each case changed the nature of work for the manager.* In addition to facilitating editors' tasks, the technologies either added work, gave more time for other duties, necessitated new tasks or abilities, changed the editor's managerial priorities, or created new responsibilities.
- *The technologies also changed the editor's approach in dealing with certain issues, especially those related to the technologies.* While some editors relied on technological "gurus" and mechanics to solve their technological woes, most attempted to increase their technological know-how or to re-educate themselves about the technology so as to better manage it.
- *The technology did not always change organizational priorities*, although some re-organization or re-shuffling of personnel was necessary to accommodate technology. Thus, the editor usually must

find new organizational alternatives for staff members in order to ease the transition to a new technology.

- *Some editors -- faced with what they view as technological "shortcomings," inadequacies or realities -- must become more adept at motivation than they were prior to the technology.* Often this involves allaying staff fears about the unknown or assuring staffers that inadequacies are being addressed. In most instances, however, these editors already command the respect of their subordinates and thus the motivational necessities are surmountable.

- *The technology forces -- or, at least, prompts -- editors to become better intermediate-range planners.* Newspaper editors traditionally are notorious for needing deadlines to accomplish anything substantive. But the technologies' limitations and operational necessities warrant some forethought on the part of editors in such areas as story and fiscal budgeting, editorial decision-making, staffing and evaluating personnel.

- *In general, technology had no adverse effect on editor-reporter or editor-copy editor relations.* Manager and subordinate claimed a professional, mutually respectful relationship unimpeded or unaffected by the technology.

- *The technology gave greater control over some aspects of the product than it gave over others.* In other words, the technology did not deliver equal and balanced product control in all areas. Pagination enhanced control over the design and layout aspects of the page but indirectly decreased control over textual content. Videotex necessitated that the general manager also market the product at the same time he relinquished consistent, traditional, day-to-day editorial control. Personal computers allowed editors to magnify their text manipulation abilities while simultaneously giving reporters greater pre-editing prerogatives to rewrite or alter news copy.

- *The technology nearly always makes the editor a better recruiter.* Editors near-unanimously appreciated the built-in appeal that modern technology holds for recruits -- most of them recent college graduates.

- *Managers had to learn to become more flexible, thanks to the additional work that technologies have created.* No management positions were eliminated in any case, but many managers reported having to do more or having more time to do tasks for which they previously had no time. In obtaining greater control in some respects, editors took on more responsibility and thus found themselves in need of new skills, such as time budgeting and non-editorial-related motivational methods.

- *Finally, the researchers sensed that a majority of those interviewed -- especially managers -- viewed the technology as basically a technical concern,* i.e., "what can the machine do *for* us" rather than the sociological or communications-related perspective of "what can the machine do *to* us." The response "I never thought about it before" was not an uncommon one to researchers' inquiries. The result, as foreseen by Salerno, sometimes has been a "frustrating mismatch between expectations and performance."[5]

From these findings, the researchers have drawn the following list of conclusions and recommendations:

(1) *Newspapers should attempt to increase the capacity of their editors to deal with technical and technically-related organizational problems.* This does not necessarily mean, as Thurley [6] suggested, that additional, more analytically minded editors be hired or sought, however. The increased capacity can be acquired simply by a participative approach to technology adoption, in which mid-level managers are consulted and adequately briefed prior to the adoption decision. Such an approach will prompt editors -- conscientious ones, at least -- to learn as much as possible about the technology.

(2) *Newspapers would be wise to study potential technology purchases not only with an eye toward economics but also with consideration of the technology's compatibility with existing values, beliefs and practices of managers and employees.* The study has shown that compatibility is a suitable predictor of motivation. Knowing what motivates the employee makes the editor's job that much easier.

(3) *Newspaper technology management must be "standardized."* The need for formal management of technology is becoming increasingly acknowledged, as Earl[7] stated, but newspapers also must appreciate that such management involves the same tasks -- planning, organizing and controlling -- as in any other managerial function. Managements may never begin to manage technology if such training is seen as "different" in any way.

(4) *Newspapers must evaluate the introduction and impact of the technologies they adopt*. Many factors need to be considered and considered in terms of regular, procedural monitoring. In other words, evaluation must be consistently done and not sporadically or occasionally conducted. The factors include job design and satisfaction, task specialization, change agents and key groups, perceptions of audiences and of other journalists, as well as any other influential factor or internal market key in adoption and diffusion.

(5) *Newspapers must evaluate the job of the newspaper editor/manager and develop a comprehensive (not exhaustive) model of management functions, priorities, roles and responsibilities.* To understand properly the impact of technology on management, it is necessary to understand what is -- as a rule -- the function of management. Perhaps management needs to be seen as a system of control comprised of a number of management roles or perhaps as a system of motivation with similar sub-roles. As it stands today, editors see themselves primarily as "editorial watchdogs" first and "technology managers" second, third or even lower. The fact that there is even the perception of a dichotomy or a priority list indicates a lack of balance.

In summary, technology has a varied impact on newspaper management. Technology has required management to re-think its methods and goals and to re-interpret its technological experiences with an eye toward not only making the technology work for employees and consumers, but also making employees work with the technology.

Eric Wolferman, executive editor of *The Reporter* in Lansdale, Pa., specifically was discussing pagination but his words could have applied to any technology when he said that many paginating newsrooms "have simply been unprepared to deal effectively with the technical, organizational and management issues that pagination presents."[8]

Perhaps a starting point could be the annual American Newspaper Publishers Association Technical Exposition and Conference (ANPA/TEC). The conference provides a vital service to its members, creating access to vendors, distributing information and stimulating interest in the latest and most efficient newspaper technologies. Although sales of equipment and supplies are not allowed, many acquisitions probably are pre-arranged or originate at the conference.

The typical hardware demonstration does not emphasize or discuss or overly concern itself with the internal/social implications of the hardware. The unspoken assumption many times is that newsroom staffers will properly and adequately operate the equipment.

The conference also features general sessions and symposia to discuss technological issues, focusing on better, more efficient and higher quality materials, equipment and supplies. Anecdotal models (e.g., "this is the way we do it at Newspaper X") and various examples lead the general search for technological excellence.

Few panel discussions directly concern technology's human factor, choosing instead to focus -- often, rightly so -- on hardware. The human factor often is examined from a "difficulties" or "problems" point of view. Speakers tend to represent the "name" media organizations or related corporations (more than half the general session speakers and slightly more than one-third of the symposia discussants at the 1987 convention, for example) thus meaning that the typical newspaper's interests and methods are under-represented.

Granted, the conference attempts to put members in contact with technology vendors and help educate members about trends, issues and concerns in newspaper technology. But the conference would be an ideal event in which the newspaper industry could disseminate information concerning the managerial problems and concerns that accompany the technology.

General Conclusions and Summary

One of this study's primary intentions was to assess whether management was influenced by technology that possessed: (1) relative advantage; and (2) compatibility. The findings suggest mixed success.

When the study results were compared with previous studies of technological impact, the nature of the technology and the involvement of management were found to play a moderating influence in any exceptions to theoretical generalizations, as did organizational roles, technology complexibility, job design, task certainty and user needs. Underlying this comprehensive list of generalizations is the concept of change, as mentioned in the foregoing discussion concerning newspaper managers.

Smith, in discussing approaches to communication, said, "The questions we pose and the problems we face are largely determined by the way we look at the world....Generally we try to answer questions using the same viewpoints from which these questions arose in the first place."[9]

In dealing with organizational change, March[10] argued that typically, it is not possible to lead an organization in any arbitrary direction that might be desired, but that it is possible to influence the course of events by managing the process of change. This view assumes that effective leadership often depends on being able to time small interventions so that the force of natural organizational processes amplifies the interventions.

March insisted, however, that comprehensive development of managerial strategies requires a more thorough understanding of change in organizations -- "a theory of how to direct somewhat the conventional ways in which an organization responds to its environment, experiences and anticipations."[11]

In review, we have seen several changes in thought concerning the variables of this study. We have re-evaluated ideas defining motivation and control and what drives management's needs to assess them. In addition, study findings have helped refine definitions of compatibility (i.e., the realizaton that compatibility is a more task-oriented variable) as well as leading to the recognition of the tandem powers of a technology's compatiblity and relative advantage -- the "thermostat" function and the "invisible editor" role of control and product/news-editorial quality perception, respectively.

On a theoretical level, it has been suggested that perhaps the "redefining" or "reclarifying" role of management in future research needs re-examination. On a newspaper managerial level, the changing nature of work has been exhibited, in content and context of the job. In short, thanks to the evidence of this study, what is known about these matters has changed and so has the way they are interpreted.

What is now needed is a more exact method or framework for examining the impact of technology on newspapers and for assessing the role of change in this impact. It is clear that newspaper organizations must change the way they manage themselves if they are to succeed in implementing emerging technologies. What is not apparent is the direction, quality or intensity of this change, in newspapers specifically and in communications organizations in general.

This study has attempted to assess that direction, but it is only a beginning step. To borrow from Peters and Waterman,[12] while examining the hardware of an organization -- the strategy, structure and technology -- the study has discovered change in the organizatonal software: style, systems, staff, skills and shared values. And as Peters and Waterman said, *innovative companies are especially adroit at continually responding to change of any sort in their environments*. It is hoped this new-found knowledge will lead, as Bogart[13] said, if not to answers, then to better questions.

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13. Leo Bogart, executive vice president and general manager of the Newspaper Advertising Bureau, in an address to the American Newspaper Publishers Association/Technical Exposition and Conference, Las Vegas, Nev., June 8, 1987.

APPENDIX

OPERATIONAL QUESTIONS AND STRATEGIES

1.00. How has the technology changed the manager's job?

Sources:
the manager
his subordinates
his superiors
Sample strategies:
-- Interview each source
-- Observe sources at work
-- To whom does the manager report?
-- Who reports to the manager?

1.01. Is that change good or bad? Why?

1.02. Is the manager satisfied with that change? Why?

1.03. How would he have designed the change if given a chance?

1.04. If no change occurred, why not? What happened? How was technology a factor?

1.10. In what ways has the technology changed the way the manager motivates his staff?

Sources:
the manager, his staff
staff publications
Sample strategies:
-- Interview the sources
-- Observe sources at work
-- How much motivation is necessary to begin with? do things seem harmonious?
-- Note technology's toll in frustration, inadequacy, downtime

1.11. What programs have been instituted since technology adoption?

1.12. What kind of motivation would professionals need? Personal? Professional?

1.13. Which personnel have needed the most motivation? Why? When?

1.14. What's the manager's view of this? Favor? Abhor? Why?

1.20. What staffing changes have been made as a result of the technology?

Sources:
the manager
his staff
personnel managers
Sample strategies:
-- Note the organization chart/roster before and after technology

- -- Interview, observe sources
- -- Note any incompetencies on part of users or any unusual efficiencies

1.21. Why were the staffing changes needed?

1.22. How were they made? By seniority? Skill? Employee request? Per policy?

1.23. If no changes were made, why not? Describe process of adjustment.

1.24. Did pay or status change accompany re-staffing? Why?

1.25. What was staff reaction?

1.30. How has the technology changed the way the manager organizes his staff?

Sources:
the manager, staff
organization chart/rosters
Sample strategies:
-- Interview, observe sources
-- Note job tasks' nature
-- Note production emphasis

1.31. What was the philosophy behind any change?

1.32. Who was main instigator/detective of the change? How did that person achieve that status?

1.33. If no change, why not?

1.34. What, if anything, has the change done to the daily newspaper operations?

1.35. What are the disadvantages, if any?

1.40. How has the technology changed the way the manager evaluates and monitors his staff?

Sources:
the manager
internal documents, memos
staff members
Sample strategies:
-- Interview, observe sources
-- Note whether this is answered positively
-- Note the pace of operations (Is evaluation taken lightly, done hastily? How is it regarded?)

1.41. Why has there been a change? Should there have been?

1.42. Does the technology make evaluation easier or more difficult? Why?

1.43. How much time is left for evaluation and monitoring? Are the jobs shared?

1.44. What kind of evaluation is being done? Why is this method in use?

1.45. If no change is made, why?

1.50. How has the technology affected the manager's planning methods and decision-making?

Sources:
the manager
internal reports
company peers
staff members
Sample strategies:
-- Note the detail given to planning
-- What are the methods?
-- Who's ultimately in charge of planning? how does it get discharged and executed?

1.51. What changes have been made? Why? What's so special about the technology?

1.52. When does planning occur? How much thought is given in decision-making?

1.53. Has on-the-spot decision-making been aided or hampered by the technology? Why? Has it been eliminated or fostered by the technology? Why?

1.54. What are the goals of planning, pre- and post-technology? Are they more attainable with the technology? Why?

1.55. Has the technology redistributed planning duties among managers or staff? How? Why?

1.60. How has the technology changed the manager's overall job performance?

Sources:
the manager
his staff
his superiors
internal reports
personnel evaluations
Sample strategies:
-- Note workload, desk appearances, presence of secretaries, administrative assistants, etc.
-- Compare perceptions pre-technology
-- Compare with answers and tone in response to 1.4-1.45 above

1.61. Does the manager feel more productive post-technology? Why? In what area?

1.62. What gets done that didn't before? What doesn't get done that did before? Why?

1.63. How has the job been made easier? Why? More difficult? Why? In what area(s)?

1.64. If no change, how was that accomplished?

1.65. How does the manager perceive himself in comparison with other managers in the company? Does the technology account for any of the differences? How?

1.70. How much additional training has the manager needed?

Sources:
the manager
his superiors

company peers
Sample strategies:
-- Note mentions of training conferences or contacts with "model" newspapers

1.71. Is there a technology "guru" on staff? How much contact does manager have with him?

1.72. What does the manager do (or what did he do) in times of a hardware crunch/problem?

1.73. How did the manager learn to operate the technology? Where? When? From whom?

1.74. How familiar is the manager with the technology *modus operandi* ? Is that by choice or by accident?

1.75. Does the manager feel competent operating the technology? Does he have much contact with it during the day? Why?

1.80. How have the manager's superiors and subordinates reacted toward the manager's work since the technology was adopted?

Sources:
the manager
his superiors
staff members
Sample strategies:
-- note tone of voice, enthusiasm, personal remarks in comparison with comments about technology

1.81. Are things better in the manager's department? Why? What's technology's role?

1.82. How much extra work has the technology meant in running the department?

1.83. What things do others notice now that technology is in place? What are most common comments from co-workers?

1.84. What is the reputation of the manager and department pre- and post-technology? Where has the change, if any, occurred and what has been technology's role?

1.85. If no noticeable change in feedback has occurred, to what can that be attributed? Is that viewed as good or bad?

1.90 How has the technology affected the manager's interaction with his staff?

Sources:
the manager
his staff
Sample strategies:
-- Interview and observe interactions

1.91. Are relations better or worse post-technology? Why?

1.92. If they are about the same, why? Is that good or bad?

1.93. What are the main gripes post-technology? What were they before? What accounts for the change and why?

1.94. Are methods of work assignment, communication, spatial relations or any other social phenomena changed by the technology? Why?

2.00. How has the technology changed the employee's job?

Sources:
the employee
the manager
co-workers
Sample strategies:
-- Interview each source
-- Observe sources at work
-- To whom does the employee report?

2.01. Is that change good or bad? Why?

2.02. Is the employee satisfied with that change? Why?

2.03. How would he have designed the change if given a chance?

2.04. If no change occurred, why not? What happened? How was technology a factor?

2.10. In what ways has the technology changed the employee's attitude toward the job?

Sources:
the employee
the manager
co-workers
Sample strategies:
-- Interview, observe sources at work
-- Note frustrations, environment around work-station
-- Watch for "old days" comparisons

2.11. Is the employee happy in the job?

2.12. What are the frustrations and the highlights of the job post-technology?

2.13. Does the work still seem meaningful post-technology? Was it ever?

2.14. What motivates the employee? Does the technology enhance or encumber that? How?

2.15. How does the employee believe things (with the technology) can be improved?

2.20. How has the technology affected the employee's attitude toward any immediate supervisor(s)?

Sources:
the employee
co-workers
Sample strategies::
-- Interview and observe sources
-- Note sarcasm or non-personal references to superiors

2.21. Does the employee believe X is a good supervisor? Why?

2.22. What does X do regarding the technology that pleases/displeases the employee?

2.23. Does X make the job easier/more difficult in regards to the technology? How?

2.24. Since the technology, has X done a better or worse job of supervising the employee? Why?

2.25. If there are no changes in attitude, how does the employee account for that? Is it the supervisor or the technology?

2.30. What skill changes have been mandated by the technology?

Sources:
employee
the manager
co-workers
Sample strategies:
-- Observe employee using technology
-- Note the ease/difficulty encountered

2.31. Did the employee have to undergo training for the technology? Where? When?

2.32. Do the changes make the job of the employee easier or more difficult? Why?

2.33. If there are no changes, why not? How was the employee able to adapt?

2.34. Does the employee feel that the changes were necessary? Why?

2.35. What further skill changes would the employee advise? Why?

2.40. How has the technology affected the employee's job performance?

Sources:
the mployee
the manager
co-workers
Sample strategies:
-- Note tone of responses
-- Check consistency with manager's evaluations

2.41. Does the employee feel more productive post-technology? Why? Inwhat way? Where?

2.42. What gets done that didn't before? What doesn't get done that did before? Why?

2.43. How has the job been made easier? Why? More difficult? Why? In what area(s)?

2.44. If no change, how was that accomplished in the employee's opinion?

2.45. How does the employee perceive himself in comparison with other employees in the company? Does the technology account for any of the differences? How?

2.50. How much additional training has the employee needed in light of the new technology?

Sources:
the employee

the manager
co-workers

Sample strategies:

-- Note mentions of training conferences or contacts with "model"newspapers/programs

2.51. Is there a technology "guru" on staff? How much contact does the employee have with him?

2.52. What does the employee do (or what did he do) in times of a hardware crunch/problem?

2.53. How did the employee learn to operate the technology? Where? From whom?

2.54. How familiar is the employee with the technology's *modus \operandi*? Is that by choice or by accident?

2.55. Does the employee feel competent operating the technology? Does he/she have much contact with it during the day? In what capacity?

2.56. If no additional training was needed, why not?

2.60. How have the employee's immediate supervisor and co-workers reacted toward the employee's work with the new technology?

Sources:
the employee
the manager
co-workers

Sample strategies:

-- Note tone of voice, enthusiasm, euphemisms, personal remarks
-- Compare with remarks of others

2.61. Are things better in the employee's department and job? Why? What's technology's role?

2.62. How much extra work has the technology meant in doing the job? Has it been accomplished easily? Why?

2.63. What things do others notice about the job now that the technology is in place? What are the most common comments?

2.64. What is the employee's reputation pre- and post-technology? Where has the change, if any, occurred and what has been technology's role?

2.65. If no noticeable change in feedback has occurred, to what can that be attributed? Is that good or bad?

2.70. How has the technology changed the employee's interaction with supervisors?

Sources:
the employee
the manager(s)
co-workers

Sample strategies:

-- Interview and observe interactions
-- Compare with others' comments

2.71. Are relations better or worse post-technology? Why?

2.72. If they are about the same, why? Is that good or bad?

2.73. What are the main gripes post-technology? What were they before? What accounts it?

2.74. Are methods of work asignment, communication, spatial relations or any other social phenomena changed by the technology? How do they affect employee-supervisor relations?

3.00. How does the technology affect the newspaper's daily operations?

Sources:
managers
employees
other newspapers
Sample strategies:
-- Compare responses
-- Look for changes in production, work patterns

3.01. What does the technology do to deadlines and time schedules? Is the pace the same?

3.02. What other departments are affected or work closely in connection with the technology?

3.03. How have things changed overall? How does the technology make the newspaper a different place in which to work?

3.04. To whose advantage are these operational changes? Who now works at a disadvantage, if any?

3.10. How does the technology work?

Sources:
employees
managers
Sample strategies:
-- Observe technology at work

3.11. What are the basic operating principles?

3.12. What options does the technology give that previously were non-existent?

3.13. What is the main technology/hardware at work?

3.14. What software is used? How does this system vary from that at other newspapers? Is it better or worse?

3.15. What is the step-by-step operating system of the technology for the typical user?

3.20. Under what priorities, goals and objectives does it operate? How effective and efficient is it?

Sources:
managers

employee/users
Sample strategies:
-- Interviews, observe the technology

3.21. What is the purpose of the technology? How does it accomplish that purpose?

3.22. How is the technology evaluated? Why are those criteria used?

3.23. What's the difference in the long-term and short-term goals for the system?

3.24. What is the timetable for reaching these goals? How realistic are those goals and the timetable?

3.25. Where is the human element (employee factor) in the established goals?

3.30. How and why was the technology selected by management?

Sources:
employees
managers
internal documents, memos
Sample strategies:
-- Compare statements with documents and reality

3.31. Who solicited whom? When? What spurred the decision to buy? What was the main factor?

3.32. What was the negotiation process like? Describe.

3.33. How big a factor was price? User-friendliness? Company goals?

3.34. What tradeoffs or cost-benefit analysis occurred? Describe.

3.40. Where on the diffusion curve does the specific technology fit?

Sources:
employees
managers
Sample strategies:
-- Analyze uses according to Rogers' levels of adoption

3.41. How long has the technology been in place?

3.42. How many people are familiar with it and can adequately operate it?

3.43. How much expertise is needed to operate the technology? Does it preclude some personnel?

3.50. What kind of trial run did the technology undergo? How much preparation did implementation require?

Sources:
managers
employees
Sample strategies:

-- Compare to other newspapers
-- Compare comments

3.51. When did the trial run, if any, occur? How many trials occurred? If none, why not?

3.52. What were the parameters of the trial? How did it differ from the current operation of the technology?

3.53. What were the results of the trial? Recommendatons from the trial?

3.54. Was the trial useful? Why?

3.60. What are its capabilities? What is its future in the organization?

Sources:
managers
employees
hardware vendors
Sample strategies:
-- Compare comments
-- Contrast to stated and published goals and objectives

3.61. What can the technology do to help the newspaper?

3.62. What would be its use 10 years from now? 20? 30?

3.63. How soon would it become obsolete, if at all? Why?

3.64. How does the technology affect the newspaper's role in the industry and in the community?

3.70. What advantages/disadvantages did it have compared to other systems?

Sources:
employees
managers
managers of other systems
Sample strategies:
-- Compare and contrast comments
-- Survey the literature on system capabilities

3.71. What can the technology do that others can't?

3.72. What are its limits?

3.73. What can or will be done to overcome hardware or software deficiencies?

3.74. Does the newspaper have a contingency plan or development plan for use of the technology? If so, then what?

4.00. How has the technology changed the competitive environment of the newspaper?

Sources:
managers
employees

industry analyses
Sample strategies:
-- Compare, contrast comments
-- Note methods used to describe competitors; analyze

4.01. Who are considered competitors? In what way? Why? For what are they competing?

4.02. Does the technology change the nature of the competition?

4.03. If the competitive environment is not changed, why not?

4.04. How does this competition manifest itself?

4.05. What effect does competition have on the technology or its operations?

4.06. Does the competition also possess the technology? If so, then who was first to adopt the technology and who now has the edge and why?

4.10. In what way has the technology affected the size, organizational structure or the daily operational constraints of the newspaper?

Sources:
managers
employees
company documents, charts
Sample strategies:
-- Note how comments compare
-- Note before-and-after aspects
-- How does technology function in organization?

4.11. How many employees are employed by the newspaper? Pre-technology?

4.12. What kind of organization does the technology demand? How did the newspaper meet that demand? If reorganization occurred, how was it implemented?

4.13. How many employees does the technology require to operate? How many are support staff? How many are managers? How does this compare to other technologies and to other departments?

4.14. What constraints does the technology put on the newspaper (besides operating costs)? Do they require additional personnel?

4.20. How does the technology change the market of the newspaper?

Sources:
managers
employees
industry analysts
Sample strategies:
-- Compare responses
-- Note effects on product

4.21. Does the technology create a change in the way the consumer communicates with the newspaper? If so, why and how?

4.22. What needs asssessments or surveys have been performed to determine market impact or market demand? When? What were the results? What effect did it have on management's decision to adapt the technology.

4.23. What markets does the newspaper consider important? What role did they have in adopting the technology?

4.24. What has been the public reaction to the product since the technology was adopted? How has it been gauged? Positive? Negative?

4.25. If there has been no market effect or no market feedback, how does management interpret that fact?

4.30. What affect does the technology have on newspaper cost, content emphasis or editorial makeup?

Sources:
managers
employees
company statistics
Sample strategies:
-- Compare comments
-- Analyze content, page design, statistical reports
-- Note any defensiveness in this area

4.31. Have there been any change in costs post-technology? Why?

4.32. Why has content changed? If there has been no change, is that good or bad? Why?

4.33. Should technology affect content, cost or makeup? Why or why not?

4.34. How much of a factor are content, costs or makeup in implementingthe technology?

4.35. Does the reader/consumer benefit in any of these areas because of the technology?

4.40. Are there any unions? What kind? If so, what has the technology done to their relationship with management?

Sources:
managers
employees
industry analyses
union leadership
Sample strategies:
-- Compare comments
-- Look for conflicting views

4.41. What is the union's opinion of the technology?

4.42. What role did the union play in technology adoption and implementation?

4.43. Since adoption, has the union had any voice in any refinements of the technology?

4.44. How does management view the union in general? In light of the technology?

4.45. How does the union view management in general? In light of the technology?

4.50. What other internal environmental relationships are affected by the technology? What is the effect on the general managerial climate?

Sources:
managers
employees
industry analyses
Sample strategies:
-- Compare comments
-- Look for similarities, trends

4.51. What is the "corporate culture" of the organization? How would you characterize it?

4.52. How much do managers normally rely on technology to accomplish their jobs?

4.53. How much do employees normally rely on technology to accomplish their jobs?

4.54. Do other departments rely on technology to the extent of that of the newsroom? More or less?

4.60. How has the technology affected managerial attitudes toward technological innovation?

Sources:
managers
employees
Sample strategies:
-- Compare comments

4.61. How does management feel about being reliant on technology to accomplish work?

4.62. How much experience does management have with current and older technology?

4.63. What does management think, in general, about technology? Has the current technology done anything to change that thinking? What and why?

4.64. What would management most like to change about the current technology? What does management most like about the current technology?

4.65. If there has been no attitudinal change, why not?